CHEMICAL MARKETS

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Dating the Depression

EVANGELINE ADAMS has read in the stars that Taurus, the Bull comes into the ascendancy this month, and Roger Babson is reported in the newspapers to have staked his reputation that the low point of the depression has already been passed. Wall Street's favorite astrologer and our best known statistical interpreter are only in approximate accord; but their dates are quite close enough to satisfy not only the most pessimistic financier, but also the most optimistic industrialist. Mr. Hoover's war debt moratorium, whatever its ultimate political and economic effects may be, has administered a spanking dose of physiological tonic to a sick world. Saner and more healthy views of the business situation prevail; and the conviction that the bottom of the commodity price decline has just about reached is growing, and with it a belief that this marks the low point of the depression.

IN THE meantime the futile hope of any economic miracle has died. Only a few very childish minds expect that some magic formula will be found to restore prosperity. The trick could not be cleverly turned by any universal debt cancellation, by a quick, sure redistribution of gold, by flattening all the tariff walls, or by a raise in prices, or a readjustment of land value, or a cut in wages.

RECOVERY will not be a rebound but a reconstruction. We are to build a new business structure upon the new and lower price level, and the chemical industry, converter of the earth's raw materials into the raw materials of all industries, will lay the cornerstone.

AND the most favorable omen of all is the clear understanding our leading chemical executives have of the fact that the way back to normalcy lies in bringing the price of consumer goods into line with a new cost of basic commodities and their determination to grasp firmly the splendid economic opportunity this creates for chemical processes and chemical products. Their efforts to lower chemical production costs and to increase chemical sales efficiency are being redoubled to take full advantage of this most favorable economic situation. All that has been done during the past year in operating economy and selling effort is but training for the paring of chemical costs and the pushing of chemical sales that they are planning for the next twelve months.

Cantaloupes and Chemistry Rumors that Henry Ford will grow 3,000 acres of cantaloupes as a raw material for the manufacture of alcohol is just the kind of item that catches the eye of those hard pressed gentlemen who write the editorials for our newspapers. The time, the man, and the product to be produced all combine to give an exceptional "news interest," and the well worn subject of how the chemist is going to rescue the farmer again comes to print.

However unlikely the starting point appears to be and however weird the process seems to operate, the more one knows about chemical industry, the more chary one becomes of forecasting failure for any chemical process. While cantaloupes hardly appear to be the ideal raw material for the production of alcohol and cellulose, it is obvious that both products might be obtained from this source. But while the chemistry of this proposal may be sound enough, the chemical economics involved are sadly askew.

To say nothing of the prospect of synthetic alcohol manufacture, it is extremely difficult to picture the successful competition of cantaloupes grown commercially for the chemical plant with by-product molasses. One need know nothing at all about the cost of producing this luscious, uncertain breakfast fruit, if one but remembers that molasses can of necessity, and if necessary will, be sold as low as one cent a gallon.

Chemists have scored sensational victories in the battle of land versus laboratory, and as a matter of fact, it is not unreasonable to expect that given time practically all materials may be synthesized; but there are many compounds which through rarity, or complexity, or limited use can always be produced cheaper by Dame Nature. In every case of synthetic versus natural the determining factor is economic.

As a healthy antidote to the fuzzy thinking so often indulged in, we commend Dr. Hale's talk before the Manufacturing Chemists' Association which we print in full in this issue. A little honest facing of the economic facts would on the one side stop the farmer from talking about dyestuffs from corncobs, and on the other check chemists endeavoring to produce synthetic rubber. It is a wholesome sermon written in vivid, interesting style for the special benefit of the research department of almost any chemical company.

The June Meetings June is traditionally the month of roses, brides and trade conventions. According to horticultural experts, municipal marriage bureaus, and press reports emanating from such pleasant points as Absecon, White Sulphur, and Swampscott, this year was no exception.

The golf tournaments and dinners would serve to stamp this year's conventions as duplicates of those held for the past ten or fifteen years. Yet, there has been a distinct difference; one that has caused repeated comment. Ninety-nine out of every one hundred men attending conventions or conferences or meetings this year have consciously or subconsciously counted up the cost of the railroad tickets, hotel bills, and that little item of miscellaneous so often abused beyond recognition, and having visualized the total as quite a sizable amount, have determined that something concrete, something directly beneficial must result from the expenditure.

There has been a noticeable lessening in the activity at the "nineteenth hole" and a greater attendance at the morning business sessions. It may be that most trade conventions had much more to discuss this year than they did in that era of large orders and still larger profits, measured by present standards.

Out of every major calamity some good is evolved even if it is of seemingly less importance than the destruction worked by the disaster. Perhaps one of these minor, but really important benefits is a different and albeit necessary change in our viewpoint towards trade associations and conventions. America is often characterized as a nation of joiners. If we joined less and attended more the net result would be a gain for constructive policies.

Military not Economic Everyone knows that the proper procedure is for the dog to wag the tail and not the tail the dog. New post-war plants for the fixation of nitrogen have been built in every corner of Europe, ostensibly to produce fertilizer, but really as much a part of armament as any battleship or fortress.

This expansion is just about sixty per cent political and forty per cent economic, and its justification, if any, must be found from the political and military leaders and not the farmers or the chemists. The peace and security of the world is more in danger from these sources of surplus nitrogen than from any militaristic propaganda or aggressive national policies. It is the pre-war nitrogen situation inverted, for then a dependence upon

sea-borne Chili nitrate as a munition held in check the sabre-rattling while the excess today furnishes an excuse for capitalizing that costly peace-time investment, the modern fixation unit.

It has become a race between the chemist trying to find new uses for nitrogen production already a fact and the politician trying to add further tonnage as a threat. Of course if the purchasing power of agriculture could be raised there would be no nitrogen over-production until the competitive tonnages required for war purposes were again subject to analysis. Nitrogen fixation, specially in Europe, has quite definitely passed from the economic to the military regime. The outlook is not reassuring. The industrialists might probably be influenced to limit production to actual needs and to work out an amicable settlement, but it is questionable whether the political element will be found as agreeable to sound reasoning.

An Anniversary A year ago when Colonel Woodcock assumed the difficult position of Commissioner of Prohibition he promised to administer the law "decently, fairly, earnestly, and above all, lawfully." It must be recorded that in the main he has kept this pledge. Under his administration it would appear doubtful that prohibition enforcement has been more completely successful than under some of his predecessors, but there is no gainsaying that his methods have been more just and decent. The use of decoys has been virtually abolished. There is much less reckless shooting off the coast and along the Canadian border. The caliber of the average Prohibition Agent has been distinctly raised. Colonel Woodcock has gone about his difficult, and in many ways thankless, task with a refreshing, quiet sincerity and when he has appeared in print, his pronouncements have been notably free of threats and promises.

All this bespeaks a serious effort on the part of a gentleman who believes in fair play.

Another change—and one of very great importance to the industrial consumers of alcohol—has come over the spirit of prohibition enforcement under Colonel Woodcock's administration. Belief in the efficacy of prohibition by means of chemistry is obviously waning. This tardy conversion to a conviction long held by the industrial alcohol producers is due partly to sentimental reasons and partly to long, bitter experience. The race with the re-naturer has always been a losing one, and the best that various formulas accomplish is to make his operations unsatisfactory because expensive, troublesome, or dangerous. Development of the bootlegging technique has long since been away from cleaning denatured alcohol to the direct production from a variety of innocent and readily available fermentable raw materials. More and more the national authorities are forced to depend upon police methods, and less and less are the various states co-operating in enforcement. Under existing circumstances and in the face of woefully inadequate funds, Colonel Woodcock's restraint and decency are particularly commendable. He must be sore tempted to borrow hi-jack tactics.

Quotation Marks

Reducing production costs to sell at a lower price is sound business; to slash prices very evidently below the cost of production is exactly the opposite. Cut-throat competition is detrimental to an entire trade. It undermines confidence and will increase unemployment. The question of enabling producers to protect themselves against ruinous competition demands prompt and effective consideration.—*Manufacturers' Record.*

The programs of most Trade Associations are inadequate for the urgent needs of the next ten years—because they have been inadequate for the past ten. They must start anew or they will not survive.—*O. H. Cheney.*

The direction in which we are heading is the way to chaos—chaos caused mainly by lack of plan eventuating from constructive business leadership.—*Dean Donham—Business Adrift.*

Russian competition in alkali products, at prices generally considered uneconomical under normal cost-basis conditions, is now making itself felt very widely. Although South America and the Near Eastern countries were first markets to be sounded with any appreciable success by the Soviet trade agencies, attempts to put Russian caustic soda, and we believe soda ash also, on the United Kingdom market were begun nearly twelve months ago, with, however, very limited success, despite the undoubted attraction of the prices quoted.—*The Chemical Trade Journal and Chemical Engineer*

Fifteen Years Ago

(From our issue of July 1916)

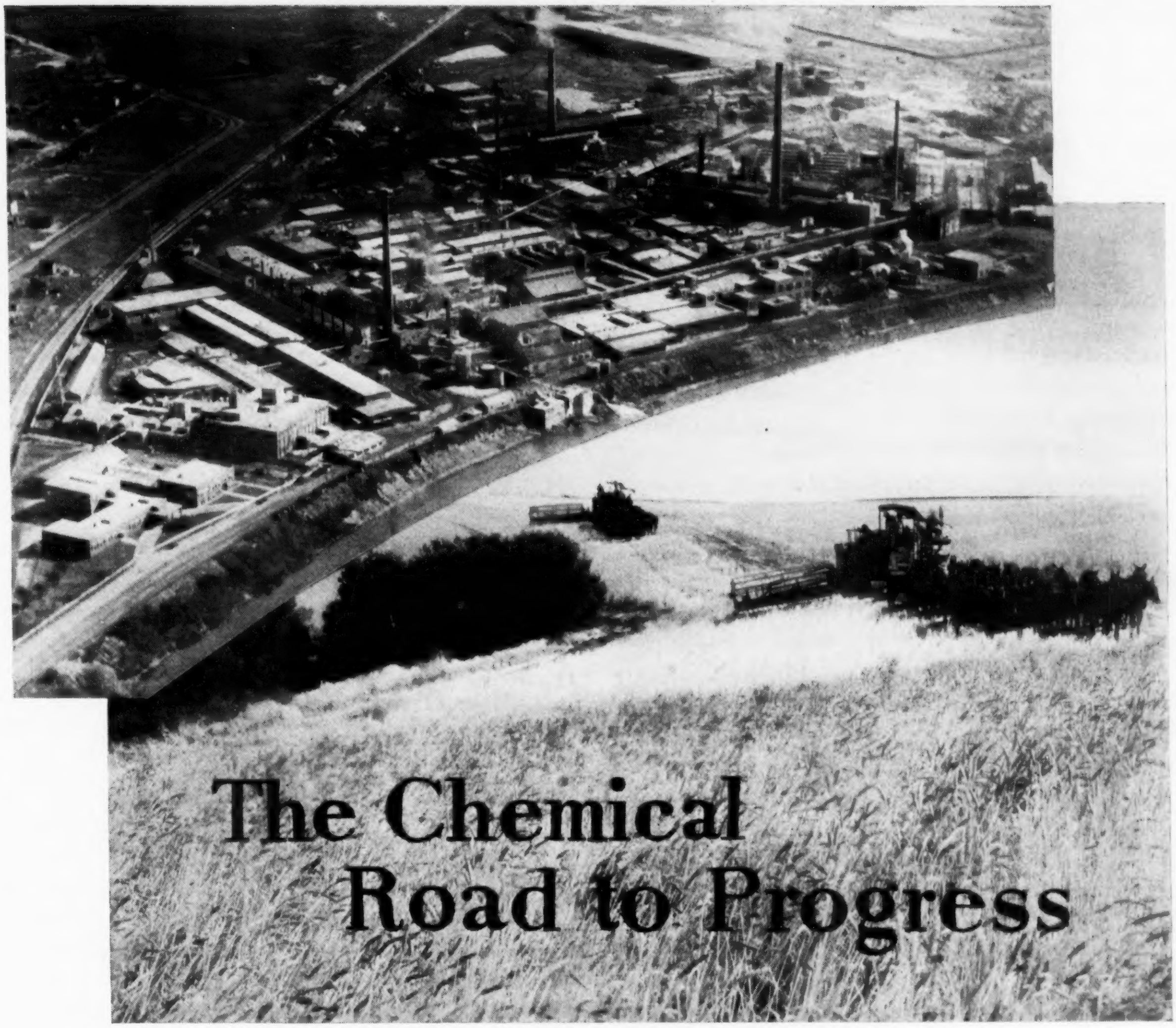
Eugene Suter announces his removal to larger quarters at 80 Maiden Lane, New York City.

Congressman Webb introduces bill to make legal associations formed for the purpose of entering into foreign trade.

German submarine arrives in Baltimore with cargo of 700 tons of dyes.

Sir William Ramsay dies in London in his sixty-fifth year.

Powers-Weightman-Rosengarten is building three five story additions to its New York Branch.



The Chemical Road to Progress

By Dr. William J. Hale*

IN THE past hundred years man has accomplished more for the development and fulfillment of the larger life than his forebears accomplished in the milleniums that have gone before. But the inborn habits of man have not so readily yielded to each new adjustment. Only through a general education of the masses has it become at all possible to create an adaptibility and ready response to the requirements of new environment. In America, in particular, our educational standards are steadily rising, thus making of this country the greatest potential market in the world.

We have been wont to look upon the farmer as the backbone of civilization. His life of independence endeared him in the eyes of his countrymen and bedecked him with a halo of liberty. Today his independence seems well-nigh dissipated, and his crown has lost its radiance.

What has come upon us that has wrought so great a change in the field of agriculture ? In the early days of our modern industrial era, ushered in by the Bessemer Furnace of 1856, we witnessed nothing of sinister portent to the farmer. As recently as 1900, no dark clouds had threatened. By 1910, however, there appeared unmistakable signs of a coming revolution. But with the advent of the World War, this imminent danger vanished. The exigencies of the War spurred every single activity to its utmost. In fact, through this speeding up of scientific technology, we note the beginnings of the downfall of agriculture. The felling hand was none other than organic chemistry.

In the early days of this century, we note the introduction of artificial silk on a commercial scale in England. By the close of the first decade, its manufacture was in operation in this country. During the World War the great demand for cellulose acetate as dope for airplane wings hastened research looking toward cheaper cellulose; and by the close of the World War we were in excellent position to manufacture alpha cellulose from wood.

Scientific development by 1918-1919 presaged a tremendous advance in the years to follow. The readjustment, however, that followed the World War,

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retarded the immediate advance, and for a year or two a period of depression fell upon all countries. During this depression, scientific research naturally did not remain dormant, and after a few years we note again tremendous forward strides in the field of technology. We should make mention here of the hydrolysis of starch into dextrose; the replacement of turpentine by mineral oils; the replacement of natural gums and resins by nitrocellulose lacquers and other synthetic plastics; the replacement of animal fats by hydrogenated vegetable oils, and many other instances.

Had the industrialists of this country taken cognizance of these scientific accomplishments and correlated them with that principle which demands an ever lowering in prices of basic commodities in an advancing civilization, we never would have witnessed that orgy of high prices which reached its climax in 1929.

It required no one of more than mediocre ability to observe that the scientific trend of the post-war period was leading directly to a substitution of the ultimate components of agricultural products by chemically prepared material. In particular I have reference to the great world of carbohydrate chemistry. This is, of course, the field par excellence of agriculture, and the chemical revolution centers upon the replacement of the well-established agricultural activities by new, diverse, and cheaper chemical manufacturing processes.

Chemistry Will Control Prices

In this organic chemical revolution lies the deep-seated cause of our present-day conditions. Those industrialists and politicians who cry aloud for higher prices on agricultural staples, in order that the money paid to the farmers will find outlet in greater purchasing power for industrial products, are only crying for their own destruction. Chemistry decrees that these organic chemical mixtures—staples, if you wish—never again can sell for more than the sum of the chemical values of their several components, and simply because these components are obtainable elsewhere with less expenditure of labor. Thus, cotton of 99 per cent alpha cellulose content is of little more value than the alpha cellulose of 98 per cent purity, obtainable now from wood at a price of six to seven cents per pound. Cotton, therefore, must compete with this alpha cellulose, and unless it

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can be sold for approximately ten cents per pound or less, it will sooner or later pass entirely out of domestic consumption. Corn, wheat, and other staples must follow in line. Corn at forty cents per bushel at the farm, wheat at sixty cents per bushel, carry a value about the equivalent of the sum of the values of the chemical components contained in these grains, and never again should sell at higher prices.

Export Business is Doomed

Immediately we hear on all sides, "What is to become of the farmer ?" This state of his upheaval, or of his being forced to readjust himself on a chemical basis, is the aftermath of our chemical revolution. Agriculturally, this nation will no longer function as an export factor in world commerce. We shall and must consume our entire agricultural output at home. The phantom cry of farm-relief is highly misleading. Relief to the drowning is ever commendable, but the first procedure is to remove the unfortunates from the water. So with farming. We need remove about half of our farmers from their fruitless existence. The remaining half, or more correctly stated, one-half of our farming lands, can furnish abundant food for our nation. In another decade, it is perfectly correct in a chemical sense to consider that another reduction by fifty per cent in our farm lands will still leave sufficient acreage from which we can supply the direct food requirements of this country; and this in spite of the natural increase in population. What our politicians really mean by farm-relief becomes more aptly stated as human relief; that is, relief to the living from antiquated methods of the past.

We must not overlook the fact that scientific progress is apparent in other countries. Agricultural products are being produced everywhere under better conditions, and naturally our agricultural exports

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must correspondingly diminish. In 1920, 17 per cent of our agricultural products went into export. In 1928, this figure had dropped to 12½ per cent. As the years go by, this percentage will drop more and more.

The effect of our chemical revolution is witnessed also in the market prices obtaining for all basic commodities. Thus, we find that many metals are selling at low prices, while coal, oil, and other products of the mines are at the lowest prices in recent history. It is indeed well that such has come about, and it is to be hoped that our manufacturing interests can take home the lesson.

What About Present Prices?

It is reported that we are in a period of depression, but how can we consider prices depressed when they approach the actual values of the products concerned. Thus, crude oil at the wells is not worth over fifty cents a barrel, nor is coal at the mines worth more than two dollars a ton, and yet there are those who would have us believe that petroleum must be conserved, that it is a great asset to the country, and that its passing might mean our undoing.

To all this, the chemists' reply is, "Tommyrot!"

We don't need this oil—use it as best we can at as low a price as possible. When it is gone, we shall use up the coal, also at as low a price as possible. When the coal is gone, we shall manufacture hydrocarbons at lowest prices; and our children will relate stories of how their fathers wasted their time digging holes in the ground to get out a lot of dirty fossil remains at a tremendous cost of time and labor. There is nothing so childish as this cry of conservation, when the chemist already knows how to provide the requirements in heat, power, and light for the human race without any coal or oil in the picture.

"Wherever a high cost of production prevails, the agriculturist, as well as the industrialist, must cease this particular pursuit. It is the constant lowering in production costs that makes for success. What we want are low-priced basic commodities, and these we will have."

It is, of course, to be understood that the commodity prices mentioned are based directly upon the present value of the dollar in purchasing power. In many cases the wage scale is yet too high, but until we can press down rents and other living costs, now so largely held upon fictitious valuation, it will be difficult to bring wages into proper alignment.

Many claim that corn, wheat, cotton, and other staples are now selling below the cost of their production. Undoubtedly, this is correct for certain sections of the country, but for other sections, decidedly "No." Wherever a high cost of production prevails, the agriculturalist, as well as the industrialist must cease this particular pursuit. It is the constant lowering in production costs that makes for success. What we want are low-priced basic commodities, and these we will have.

One Way of Preventing Surpluses

In fact, we must guard against any tendency in the coming years that might lead to a rise in basic commodity prices, as judged primarily upon world prices. Curtailment in acreage under cultivation of direct food staples can never be enforced—grown-up men ought to know this, but seemingly our statesmen have it yet to learn. The principle is simply this: Each and every man has a right to live. Only by the introduction of new agricultural pursuits can we ever hope to prevent any one particular staple running too far into surplus.

The great outlet for agricultural staples is the chemical industry. Farmers should enter into contract with nearby chemical units for the delivery to these units of the products needed. Under a contract based upon acreage, no matter what number of bushels the farmer can raise per acre, the industrial units must take all that the acreage under contract produces. This procedure at once promotes efficiency, and at the same time holds prices at proper levels. What matters it if up to this time no one has been willing to contract with the farmer? Certainly no rational individual or sound organization could be expected

to pay the exorbitant prices that heretofore have obtained for the crudest kind of chemical mixtures, prices out of all proportion to the combined selling prices of the several components contained in these mixtures. With agricultural commodities now approaching their chemical values, it is reasonable to anticipate a greater and greater adaptation of these commodities to chemical processing.

It cannot be expected that within the next year or two all of the corn, wheat, cotton and other staples can possibly find an outlet in the chemical industry. This means that the farmers, in the meantime, must undertake the cultivation of other agricultural products that may more quickly find chemical utilization. In this direction our industrial organizations must bend every effort toward the furtherance of chemical manufacture, making use of the raw materials of the land. Those who fear discontinuance of natural products as raw materials for chemical enterprise should bear in mind that chemistry can not more cheaply synthesize carbohydrates and proteins than does Nature. It is our duty, therefore, to make our farm lands a more and more dependable source for the raw materials of industry. In this lies the greatest possible future both for agriculture and industry.

Are We in a Depression?

We read today with amazement lengthy articles discussing the cause of this so-called depression. Some ascribe it to high tariffs, others to international debts, others as an aftermath of the World War. As a matter of fact, it has little or no relation to any of these chimeras. In truth, it is no depression at all. It is merely the return of a chemical world to normalcy, or to that state where chemical worth and price values are consonant. If we can maintain this state, we shall be able to build to greater heights than the world has ever dreamed in its rosiest dreams. The downfall of fictitious prices naturally threw inefficient and uncalled-for manufacturing out of kilter. This precipitated much unemployment, a menace to normal production and consuming power, and typifies the present as life at low gear. Today we are experiencing a readjustment of our activities to a sane and scientific basis.

No better solution for our unemployment can be inaugurated than that of public works, but during the next year or two in which construction work will be under way, we must make ready with new projects and new articles of commerce. As rapidly as public construction nears its close, just so rapidly should new ventures be undertaken. The mistakes of yesterday need not restrain us. Every industry should become lavish with money for research; upon this more than all else rests our security for the future.

It seems now almost impossible to understand why men of vision were ever led to place so much money in one single type of activity; namely, the automobile. Many automobile companies were organized for no other purpose than to make a few cars and sell them as quickly as possible to reap a profit, knowing all along that there was practically no hope for the organization to improve on the standard models of the time, and certainly no way to offer better service to purchasers. The automobile industry must awaken to the realization that it has far too many units of manufacture ever to secure efficiency for itself and confidence on the part of the public. But this industry is only one of many that have claimed too many participants. It has always seemed easier to follow others; possibly because our business men and bankers lacked sufficient insight and confidence in scientific endeavor to inspire pursuits in new directions.

Herein—in the enlargement of our activities—shall we find the solution of our present-day problem,—the one and only direct means of pronouncing a doom upon all unemployment. Many researches already completed and many in process of completion are begging for sponsoring. Primarily the problems touching raw products from the land constitute the exact type upon which money should now be spent. Of these, a few will be mentioned.

The Jerusalem artichoke for western lands requires little cultivation, and yet is capable of tremendous yields per acre. Aside from utilization in the form of new foods, the tubers will supply levulose,—that sugar 50 per cent sweeter than sucrose, or ordinary sugar, and far better than sucrose for the human system. The engineering problems necessary to insure the successful operation of a levulose plant on a commercial scale are still to be worked out; a few months' time and a few hundred thousand dollars will guarantee the success of the enterprise. The result is staggering to the imagination; it means the utter banishment from our tables of all cane and beet sugar, and the directed efforts of thousands upon thousands of our farmers toward the supply of our entire needs for sugars,—not alone levulose, but its counterpart, dextrose, derivable from corn. Is there anything inherently evil in helping our agriculturists to supply the more than ten billion pounds of sugar consumed annually in this country, instead of wasting millions upon millions of dollars on Don Quixote schemes to buck the law of supply and demand? Would it not be well to spend a mere trifle under proper scientific direction, and in channels that cannot fail?

The peanut should be more extensively grown in southern lands for its oil content. The hydrogenated peanut oil offers one of the best substitutes for lard ever brought on the market. Another plant that should be cultivated extensively in the south is the sweet potato. From it we shall be able to prepare

starch, as well as other carbohydrates. A hundred thousand dollars alone, under proper direction, would insure success. Soy bean is yet another valuable plant for cultivation. It affords an excellent source of protein and nutritious flour; the oil is gaining steadily in industrial use.

The poplar tree is our fifth example. It may be grown in southern or semi-southern lands. A period of five years will be necessary for the plantings to attain proper size; these plantings should be made at once. A yield of poplar wood amounting to 3—5 thousand pounds per acre per year is well within expectation. A return of thirty dollars per acre can easily be assured. The use of this wood for paper pulp is steadily growing. It seems a pity that those dwelling in the southeastern section of this country must still be afflicted with cotton growing, when there are so many other crops that promise real financial returns.

The End of Droughts

In many locales, little attention will be required for cultivation of the new agricultural staples. In some sections, however, we shall need an extensive system of irrigation and proper supply of fertilizer. For centuries upon centuries our rivers have been flowing down to the sea. This is no fault of the rivers, nor of the sea, which certainly is full enough. It is merely one of those frightful wastes which man has tolerated. Seemingly, the fisherman's angling for unsuspecting itinerant fish has bred a philosophy of laissez-faire, and has so hallowed "flowing water" that the greater idea of utilization seemed utterly distant to man, even in his normal state. Now our rivers should be made to flow backwards;—more correctly, the water of our rivers should be pumped through countless channels till every acre under cultivation can receive its full quota of moisture: a minimum of 300 pounds evaporation from growing plants to photosynthesize one pound of product. Your great-grandchildren will listen with wonder and awe to the stories their parents relate of how drought, like the wild Indians of yore, often attacked man unawares. It is here that the Government can build most securely for the future.

Nature stands ever ready to work with man. We shall concede that in many instances, such as the dyes alizarin and indigo, man has been able to displace Nature's workshop by reason of lower manufacturing costs. In general, however, Nature is at a decided advantage where consideration is given to mixtures of compounds, or that class comprehended by our agricultural staples. When a great variety of chemicals in vapor or solution are brought into direct application to growing plants and trees, we shall enter an era of chemical glory. This era will be characterized by a multiplicity of natural products for every use of man. It will typify the period of close cooperation between man and Nature, and it will dispel forever the gloom that so consistently pervades our conservationists. New foods will everywhere appear; vegetable proteins, replacing the meat of dead animals, together with new fruits and vegetables, will make life an Epicurean delight.

Farm output will increase materially in quantity. The agricultural centers, operating the first stages in chemical processing, will undoubtedly bring about a reversal in the movement of our population. Whereas in 1920, 56 per cent of the population lived in rural communities, in 1930, 51 per cent so resided. By 1940, at least 60 per cent should find themselves located in rural centers. At this point it is well to bear in mind that a broadening in use of agricultural staples may not completely eliminate the possibility of surplus. Surplus is the assurance Heaven gives to man that his efforts are blessed. Chemical utilization of that particular agricultural staple in surplus will be required as a means of chemical storage which can act as a stabilizing influence against future surplus of this staple.

Not alone shall we cultivate our lands for material to serve as food, raiment and shelter. There is a larger use in store. This is the application of sunlight on islands contiguous to our shores. Through chemical and physical development in southern waters, we shall obtain tremendous quantities of power. If England and France would like to sell us something, why not sell us what we really need, such, for example as their island possessions in the West Indies. These islands will some day far surpass in value the sum of the total indebtedness of England and France to us. Amicably, now, their debts could be wiped out by one simple trade, and all parties would be richer.

Wiping Out the Debts

The island inhabitants, to a great extent, would need be transported to the country of their choosing, but at our expense. The islands, of course, would practically be denuded, and would be oeperated as chemical centers. Furthermore, as a kindly act, we should donate to England and France as many naval stations in these waters as they may desire. Though this suggestion for international debt settlement to this country may be considered practical, scientific, and altruistic, yet we shall find our European diplomats utterly lacking in daring and foresight. The medieval mind still dominates the European.

So much that we do is wrong—wholly inconsistent with the state of present-day knowledge—that it becomes difficult to find anything that is right. All we are, all we do, all we ever hope to be, is merely a matter of chemistry,—and yet chemical considerations of our daily problems are seldom sought. Our

daily life is just one grand obsolescence. We still make use of hides of animals for shoes; we still saw timber to extract flat boards; we still plow fields for aeration and killing of weeds; we still use gasoline and air for internal combustion engines; we still haul coal by railway; we still use coke in metallurgy; and the noise in our cement covered streets, littered with street cars on steel rails, outstrips Bedlam. What travesties on research!

Progress Through Chemistry

There is an inertia about the average business man that renders him resistant to change. Processes long out of date are discarded with no gusto. The abdication of Flimsy Excuse as a reigning power or basis for business organizations is everywhere rampant. The day of reckoning is at hand. Upon chemical factors alone lie the basic hopes for success of all enterprise. Those who will not grasp the new shall certainly be lost. Through mutually interchangeable privilege upon a royalty basis, we must hasten to contract with those who can supply us with any new improvement affecting our each and every pursuit. Thus the many research projects crying for commercialization will find ready adoption,—and to the end that greater and greater chemical adaptation of Nature's gifts to man will contribute increasingly to the larger and fuller life.

Delivered, June 4, at the annual meeting of the Manufacturing Chemists' Association at Absecon, N. J.

Foreign News

Attention of the industrial chemical industry was centered during the month in Paris where the meeting of the synthetic nitrogen producers was held attempting to renew for at least another year the pact signed last August. As all of the sessions were held behind locked doors and no statements were given to the press showing what progress, if any, was being made, little is known of what took place. Statements reported from individual members were mostly pessimistic concerning the outcome and the ability of the synthetic producers to satisfy everybody and so make it possible for them to work out an agreement with the "Cosach." It is felt in most quarters that a new deal will be necessary with the natural producers due to the much stronger position of the Chilean interests because of the combination of members into one important and powerful group.

On June 19, it was reported from Paris that the members of the synthetic conference had adjourned without reaching any agreement owing to the Norwegian demands. Despite this setback it is felt that when the conference again convenes at the end of July at the Hague that the conflicting interests will get together again probably on the same basis as the present one.

In England interest centered chiefly in the 1930 Alkali Works Report summarized briefly on this page and the reaction of the employees of the I. C. I. and other chemical producers to the wage reduction. While some discontent was reported, the concensus of opinion seemed to be that the workers were accepting the inevitable with little dissatisfaction once the situation was properly explained in detail.

The agreement takes effect in the second week of June and affects 80,000 men and 24,000 women operatives. Under the terms of the agreement wages of day laborers will be reduced to 1s an hour (25c) and those of shift men to 1s 1½d (28c) an hour. In the case of piece workers the reduction will be 5 per cent. The reduction of day laborers' wages will come to about 2s 6d a week and of shift men to about 3s 4d a week.

During the past month the tin producers met in Paris and announced that the tin curtailment program after June 1 is based on 35% from 1929 world tin production, which was roughly 188,000 tons. The output of tin was 173,000 tons in 1930 with consumption around 142,000 tons.

British Alkali Works Report

The issuance of the 1930 report of the Chief Inspector under the Alkali, etc., Works Regulation Act of 1906 has aroused considerable interest both in England and abroad. This comprehensive survey affords a splendid view of the development of the chemical industry during the past year and especially at this time indicates how conditions have changed due to the curtailed activity in manufacturing.

A decline has been registered in the number of establishments, 1,082 in 1929 to 1,042 in 1930; also a decline in the number of separate processes, 1,975 to 1,911.

The most interesting angle from the outside viewpoint is that portion dealing with general trade conditions. The report testifies to the fact that the reduction was most acute as the year ended, but goes on to state that a very definite feeling of optimism prevails concerning an early return to normal conditions and suggests the wisdom of manufacturers building now in anticipation of this demand.

The report shows that the Leblanc process is still declining. It reports new plants at Stavely and Billingham for the production of caustic soda and chlorine by the electrolysis of salt and a new patented process for the manufacture of rouge at Lancashire glass works. A very significant statement is that the use of pyrites in place of brimstone continues to gain ground. In South Wales, the report states, it is anticipated that many of the chamber processes will cease to operate as a result of the large output of acid made from zinc blende by the National Smelting Co.

Naturally, because of its prime importance in England's industrial chemical picture, the coal distillation industry receives a prominent place in the report. Some drop was in evidence in total tonnage of ammonia as shown by the following figures but the decline was much less than was anticipated.

Reading between the lines it is evident that the British chemical industry is in excellent shape considering the difficulties and readjustments that have been necessary, because of international trade conditions and the amalgamation of so many companies into new alignments.

STATISTICS FOR AMMONIA AND TAR IN 1930

(a) Ammonia Products Manufactured

Expressed as Sulfate 25 3/4 per cent NH_3)—Tons

From Liquor Produced in—	*1930*	*1929*	*1928*
Gasworks	142,271	142,017	145,066
Other works (including coke ovens, iron works, producer-gas, synthetic, etc.)	566,960	698,466	404,450
Total	709,231	840,483	549,516

Note.—Of the total quantity of ammonia products, the equivalent of 51,662 tons was manufactured as concentrated ammoniacal liquor; the balance, 657,569 tons, consisted of other ammonia products (sulfate, chloride, nitrate, etc.).

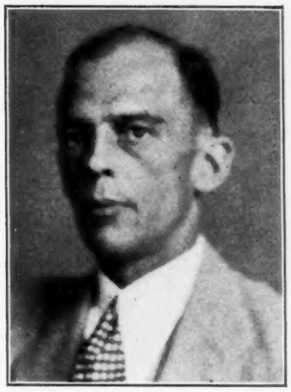
(b) Tar Treated

	Tons
Tar distilled	1,652,826
Pitch produced	443,465

The Eleventh Congress of Industrial Chemistry, which begins on September 27 in Paris, has extended a cordial invitation to the American Chemical Society to send a delegate who will present a paper before one of the sections of the congress. This meeting will take place while the International Colonial Exposition is being held.

The Chemical Market In The Plastics Industry

Expansion in industrial chemical manufacture in the past fifteen years has been materially aided by the remarkable growth in the use of molded plastics. In this article, first given as an address at the Plastics Symposium at the recent Chemical Exposition held under the auspices of Plastics & Moulded Products, the market for industrial chemicals in this field is splendidly summarized.



By Bradford S. Covell*

BECAUSE of new chemical processes, cheaper products and increased demand, the plastics industry has grown from one of fourteen and one-half million dollars in 1914 to over one-quarter billion in 1929 and today ranks as an important consumer of varied chemicals.

The types of chemicals required by this industry are varied and cover so wide a field that it has been thought best to discuss them in relation to the various groups of plastics in which they are used. On a basis of chemical derivation and in the order of their application and importance synthetic plastics may be classed as follows: (1) The resins of coal tar origin, (2) the cellulose derivatives, and (3) resins of non-coal tar origin. These materials may all be used in solvents as coatings or with inert fillers and pigments in molding compounds. This discussion will be confined to their applications in molding or pressing.

The resins of coal tar origin—the phenol resins—are the best known and most widely used of the synthetic plastics. As raw materials for their manufacture, but two types of chemicals are required in large amounts. These are phenolic bodies such as phenol and the cresols, and formaldehyde or its derivatives.

The phenol resins, more than any other group, have taken the lead in indicating the possible development of new and broader uses for plastics. In 1922 1,200,000 pounds of phenol were produced, while in 1929 this figure had grown to over twenty-four million, of which 73% was used in the manufacture of resins. The plastics industry has thus become the backbone of the phenol industry. Phenol is also used in the preparation of medicinals and pharmaceuticals as well as in

*Arthur D. Little, Inc.

A film projection machine constructed entirely of molded plastics except for the optical and mechanical parts

dyes and dye-intermediates, and in, war time, in the manufacture of picric acid, an important military explosive.

As a substitute for phenol in the manufacture of these resins, cresylic acid is used as a cheapening agent, or when resins of special properties of flow or cure are required. In general, it may be said that cresylic acid for resin making should contain a minimum amount of the ortho-cresol, whose B.P. is 191°C, and a large proportion of the higher boiling constituents—meta and para cresol and xylenol—whose boiling range is 202-225. The presence of ortho-cresol gives a very slow reacting resin when a cresylic acid containing an appreciable proportion of it is condensed with phenol.

Large amounts of cresylic acid for use in resin making come from England duty free, in 1929 about 18,000,000 pounds being imported. Other uses for cresylic acid are: in the preparation of tricresyl phosphate, a substitute for camphor as a plasticizer for cellulose plastics; and in germicides, antiseptics, and similar products.

With phenol and cresylic acid, formaldehyde and its derivatives are required in large amounts for the manufacture of these resins. Formaldehyde is commonly used as the 40% solution, but considerable amounts are also required of the formaldehyde derivatives, paraform and hexamethylenetetramine, commonly known as hexa. About 52,000,000 lbs. of the 40% formaldehyde solution were produced in this country in 1929, about twice as much as was required in 1924. From this 40% solution, the solid hexa is made by reacting formaldehyde with ammonia. Hexa is used in considerable amounts in resin making as it furnishes a convenient method of introducing formaldehyde and ammonia, as a solid, into a partially reacted phenol resin. Formaldehyde is also an important chemical in the third group of plastics which we will discuss later. Almost entirely because of the demands of the plastics industry, the production of hexa increased from 1,300,000 lbs. in 1927 to 2,400,000 lbs. in 1929. Other uses for formaldehyde and its derivatives are as a preservative and disinfectant.

In addition to phenolic compounds and formaldehyde, and of equal importance in the manufacture of these resins, alkaline catalysts, such as ammonia and caustic soda are required. These are, however, used in such small amounts as to be an almost negligible proportion of the total output of these chemicals.

Since 1920 the production of the phenol resins has increased from about 4,000,000 lbs. to 33,000,000 lbs. in 1929.

In considering the plastics of coal-tar origin mention should be made of the latest addition to this group. This is the polymerized styrol resin. Ethyl benzene is the starting point for this resin, which was in a purely experimental stage until last year. Because of the abundance of raw material and because of the very encouraging reports as to the properties of this resin, especially in the field of electrical insulation, it is an interesting addition to the plastics industry.

Second in importance in the molding field to the coal-tar plastics and requiring a far greater diversity of chemicals are the cellulose derivatives. The two esters of cellulose, the nitrate and acetate, and modifications of them, are, of course, available for a wide variety of uses. If considered in all of their applications, such as wrappings and coatings, as well as in molding, this group would out-rank in volume and

Attractive Beetleware makes the tea table more appealing. Available in a number of light colors

A new art has been created in America—synthetic molded plastics

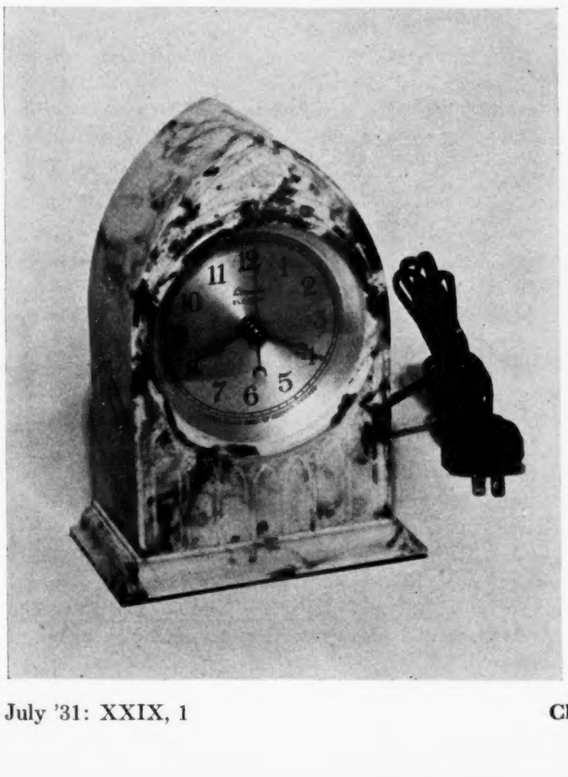
value all the other plastics. For uses other than molding a large number of various solvents and mixtures are required which are in themselves a very important group of chemical compounds.

A photograph that requires little explanation—molded Sumarith

The starting chemical for all applications of the cellulose derivatives is cellulose. Chemically this is a very complicated compound whose true internal structure is not yet fully understood. The form in which cellulose is used varies widely. Wood pulp, cotton waste from spinning mills, cotton linters, in fact almost any form of natural cellulose may be used. The most commonly used form is cotton linters. Whatever the form, unless in an extremely pure condition, it must first be purified and then usually bleached. The purification consists in cooking under pressure in weak alkalies and beating or pulping under much the same conditions as exist in the manufacture of paper. This is followed by washing, and bleaching, usually with hypochlorite. The cellulose is now in a fit condition for its conversion to the nitrate or acetate.

The plasticized cellulose nitrate or celluloid is the oldest of the cellulose group. Sulfuric and nitric acids are required in a large proportion to the amount of cellulose treated. After nitrating, the cellulose has changed but little in appearance but remarkably in properties, being now soluble in a wide range of volatile solvents. In order to make it plastic or moldable under heat and pressure, the cellulose nitrate is mixed with an alcohol or solvent solution of the plasticizer. Camphor is the oldest and most commonly used material for this purpose. Camphor is obtained naturally by steam distilling the leaves and wood of the camphor tree. Considerable amounts are also manufactured from pinene, the principal constituent of turpentine. The camphor is thoroughly mixed and kneaded with the cellulose nitrate until the mass is in a homogeneous pasty form when it is rolled and formed under heat and pressure with subsequent cutting to sheets; or it is extruded to form rods or tubes, the excess solvent being removed by drying under moderate temperature—100 to 120°F.

In addition to the plasticizer, a stabilizer is required. This is a minor constituent of the mix whose important functions are to take up acids formed on the slow decomposition of the ester, to retard the rate of further decomposition, and to prevent discoloration. Urea is extensively used as a stabilizer alone or in a mixture with weak organic acids, such as lactic, boric and tartaric acids. Other stabilizers are caustic soda, calcium oxide and zinc acetate. Aniline dyes, lakes and pigments are further required as coloring materials.



Craftsmanship of the highest order is possible even with mass production methods which make molded plastics so reasonable in price. Left, an example of molded Durez. Below, a toilet set in onyx Amerith, a contribution by the Celluloid Corporation

Non-flammable, and of possibly far more potential importance in plastics is the acetate ester of cellulose. The same purified and bleached cellulose is the starting chemical. In Acetylizing, acetic anhydride, acetic acid and sulfuric acid are the chemicals required. Unlike the nitrate, the cellulose acetate is soluble in the esterifying agents and is precipitated therefrom by the addition of water. Like cellulose nitrate, the acetate must be plasticized, and for cellulose nitrate, camphor is the ideal plasticizer. But this is by no means the case with the acetate derivative. For many years there has been an incessant search for a plasticizer which would be suitable for all applications of cellulose acetate. It is safe to say, however, that the perfect plasticizer for cellulose acetate has not yet been found. A plasticizer should be inodorous, a fire retardant, stable to light and heat, substantially non-volatile, of high dispersion power in the ester gel, and a liquid or thermoplastic. Among the chemicals best suited are triphenyl and tricresyl phosphates. Other compounds used are dibutyl phthalate, ethyl and methyl phthalate, and various sulfonamides, and mixtures of these. The acetate is worked and processed into a plastic form in substantially the same manner as the nitrate, after various colors and pigments have been added to the mix.

Developing White Colors

Several new plastic compounds have been developed, primarily to obtain what the phenol resins did not supply, white and translucent colors. We thus come to our third group: the plastics of non-coal tar origin. Developed originally abroad and recently offered in this country with considerable success, are the resins made from urea, thio-urea and formaldehyde. These chemicals in the presence of a dilute acid readily combine to give a colorless resin with thermo hardening properties which can be readily molded. Its main application has been in the non-shatterable tumblers, dishes and cups.

Urea is now practically all made abroad but during the war was manufactured in this country, as well. It is made by either of two processes, one of which employs ammonia and carbon dioxide and the other calcium cyanamide and an acid. Most of the urea produced is used as a very high grade fertilizer, while the second important use is in plastics, for which it is predicted that 50,000 pounds will be required this year. Thio-urea, not a derivative of urea but very similar chemically, is also now made entirely abroad.

The resins of phthalic anhydride and glycerine, the glyptal resins, have a very extensive use as coatings but a rather limited use in molding because of the high temperature and long period of time required for the conversion into their final form. Glycerine is a by-product of the soap industry used extensively in various forms of tobacco, in pharmaceuticals, in the explosive industry and as an anti-freeze. Phthalic anhydride is made by the catalytic oxidation of naphthalene and its most important use is as a raw material for dyes.

An old and well established group of plastics are those of casein and formaldehyde. The starting material, casein, exists in cows' milk in a suspended or colloidal condition. After separating the cream at the dairy, the skimmed milk contains about 3% of casein, which is coagulated and removed, preferably by means of rennet. After cleaning and grinding, various dyes and pigments with water are incorporated in the casein and a plastic mass is obtained. Rods, sheets and blocks are obtained by extrusion and pressing from which the finished articles are fashioned by further pressing or machining. By immersion in a weak formaldehyde solution the casein is hardened considerably and made more water resistant. The pieces are then finished by a slow, careful drying.

Other members of this group of plastics which deserve more than passing notice are the new vinyl resins. These are now in about the same status as the styrol resins previously mentioned. Their raw materials are the readily available hydrocarbons ethylene and acetylene from which are obtained vinyl chloride and vinyl acetate. Under the influence of sunlight, or heat and pressure these compounds polymerize to give a resin which may be used in molding compounds or to give tough and flexible coatings.

New "Acna" Plans Complete

Plans were announced earlier in the year calling for a new "Acna" to take over the defunct company. These have now materialized and the I. G. and the Montecatini have supplied the requisite capital. The new Aziende Chimiche Nazionali Associate (Acna) will obtain the two dye plants but the dynamite plants of the old Acna concern will go to another company, whose capital of 10,000,000 lire will be subscribed for by Montecatini alone. Also the Bianchi Dye Works, which have hitherto been owned by the I. G. Farben alone, will be jointly operated with Montecatini in the future Montecatini will take over 49 per cent of the 20,250,000-lire capital of Bianchi, thus ending competition.

Canadian News

Canadian chemical production last year reflected the depression which affected industry generally, declining approximately 12 per cent in value from the 1929 total, according to preliminary figures of the Dominion Bureau of Statistics.

The year's production was valued at $122,266,852, against $138,345,221 in 1929, it is shown. The total for the year, however, was only slightly below the 1928 production and exceeded the average for the previous five years.

Imports of chemicals and allied products into Canada during the year totaled $36,785,050, against $40,131,178 in 1929. Exports declined in value to $13,320,506 from $21,827,696.

At a preliminary meeting held in Paris last month, European and American zinc producers in Brussels have decided to resume negotiations for an international cartel early in July with Canadians, Australians and Mexicans. Drastic reduction in output is contemplated.

Politics and Chemistry

The Responsibilities of Legislators and Executives

By the Hon. Henry D. Hatfield
United States Senator, West Virginia

CHEMICAL investigations today are reaching such vast proportions that it is difficult for the layman to comprehend the scope of the program of research being conducted by your industry. I doubt if there is any other industry of this country that has been as progressive as well as having the keen foresight that can be cheerfully accredited to yours. In many cases I am reliably informed, as much as twenty-five per cent of the net profits are allocated to research.

A distinguished physician previous to his entrance into Congress, Senator Hatfield's scientific training enables him to bring to questions concerning the chemical industry a sympathetic understanding that is as necessary as it is unusual on the part of our men in high political office. It is indeed most fortunate that the important industrial chemical industries situated in West Virginia are so ably represented in Washington.

Here, in my judgment, rests the future of your industry. Assuming, of course, that your Government will be as friendly and as considerate in the future as other Governments have been and are at the present time of their chemical industry in the way of a sufficient tariff protection against the great chemical cartels that has been established in foreign countries, I have no hesitancy in predicting that our American chemical industry will surpass that of the world.

Today, through your efforts, aided by adequate tariff protection, the American chemical industry has a payroll which is twice as large as the rest of the world.

The wisdom of fire insurance is universally recognized and firmly footed and relied upon in all industries. Bond issues sometimes are found necessary to keep the wheels turning, but to me as an outsider, and yet a deeply interested observer, I am impressed with the thought that in the years to come the facts in the strong-box, the accumulated knowledge of new methods and new products, will be recognized as a commodity, more valuable than cash—a true yardstick for security and progress. And I trust that this new visualization of investigation and research work will be considered by you in obtaining a balanced perspective.

How many of your executives have read of a patent which in a remarkably short time has spelled the doom of an existing plant or product?

It would be idle to ask whether the indigo barons of India witnessed their hopes go glimmering for their industry in the patents covering synthetic indigo. But is it idle to ask you whether the executives of your industry are giving enough attention to the newest discoveries and developments in order that you can visualize what revolutionary changes these are bound to bring to the future?

Kipling said, "They copied all they could follow but because they could not copy my mind, I left them sweating and stealing a year and a half behind."

I see a forecast of the world of tomorrow which can be read in your research laboratories of today and I see in the world of the future a different and better world than the world of today. Frequently one industry can take a leaf from the experience of another with great profit. The research expenditure of the chemical industry is estimated at several million dollars per month. Selecting any industry in which progress has been consistent and rapid, research is always at the background.

The cooperative plan of the automobile industry in the pooling of the results of research patents, probably more than any other factor made possible the

phenomenal progress of that industry. I wonder, therefore, whether the possible tremendous duplication of your own industry could be ameliorated in certain fields and phases by adopting a cooperative activity in the interest of expediency, economy and efficiency?

I was greatly impressed by the reading of an address by the President of one of your firms who has a membership in this Association. This address dealt with industrial stabilization.

It raised the question in my mind, "What is the responsibility of good citizenship in a constructive program for bringing about normal business activity?"

I also ask myself the question, "What is the responsibility of the legislator on the same question."

The American business man has the responsibility as well as the ingenuity to work out our dilemma. There can be no question that if he does not become primarily interested he will become so secondarily. He, therefore, might better give consideration in a constructive way than to be compelled to give his time and energy in the correction of faulty, inequitable pieces of legislation that would ultimately fall of their own weight. The solution quite logically, will more likely be successful from his sound deliberation and constructive efforts, if only he can see that he should be humanly and otherwise interested before the legislator undertakes to solve this problem himself.

A contribution dealing with this momentous question I have in mind, relates to the remarkable work of one of your own number, dealing with stabilization of business. I have been deeply impressed with the resulting security that it offers to the wage earner's income. I refer to the program of Proctor & Gamble Company of Cincinnati, Ohio. Allowing for tremendous difficulties and obstacles to be overcome, it is apparent that they, after years of actual tests, have blazed a trail in the industrial life of our country. The program was briefly summarized by President DuPree as follows: "Our plan briefly is this: We estimate our sales for a year. We divide the production into forty-nine weeks with the thought of operating at least this length of time. This gives us a uniform production, week by week. But neither our sales nor production are uniform. Therefore, we store our excess in warehouses when production exceeds shipment, and then draw from these warehouses when shipments are in excess of production. If we have made accurate calculations, we come out even at the end of the year. That, in a nut-shell is our plan."

Col. Proctor's phrase covers this in a unique fashion: "Uniform production is cooperation on research, advertising, selling, production, warehousing, distribution with the distinct objective of securing regulation."

With this plan in control of factory production, aside from the advantage of plant efficiency and investment, there is an aspect of security which is difficult to over estimate. First, the wage earner and the employee feel assured of continuous employment throughout the year, with a known income, and anxiety and unrest are eliminated. The frame of mind and the poise of a man who is permanently employed, when multiplied by millions will play a most beneficial part in the life of our country. Should this principle be given favorable consideration by our industrial captains generally, it will serve to level out the peaks and valleys of business activity. No one supposes for a moment that they can be altogether eliminated. We should, however, strive for their reduction to a minimum.

The talk of stabilization leads to another responsibility for the executives. The extremely difficult question of unemployment insurance in the absence of any actual experience which would be necessary for an insurance company to have upon which to predicate unemployment insurance, would be, if undertaken, found an almost insurmountable question from an equity point of view.

Chemical executives who heard Senator Hatfield's address at the Manufacturing Chemists' Association meeting

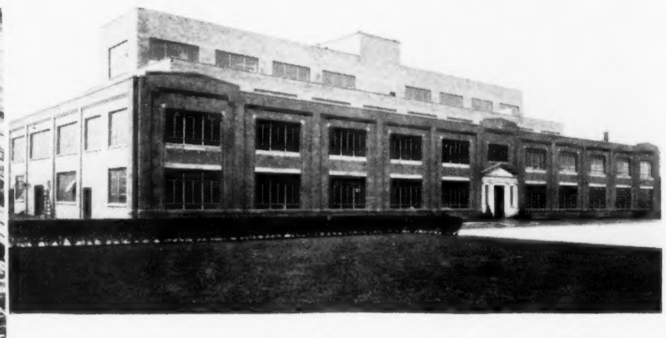
CHEMICAL

Photographic Record

Wide World

A bronze statue of John Harrison, commonly known as the "Father of American Chemistry," designed by Lawrence Tenney Stevens, New York sculptor, which will be placed in Fairmount Park, Philadelphia. At present the statue has been placed temporarily in the courtyard of the University of Pennsylvania. Mr. Stevens also designed the Chemical Markets Medal

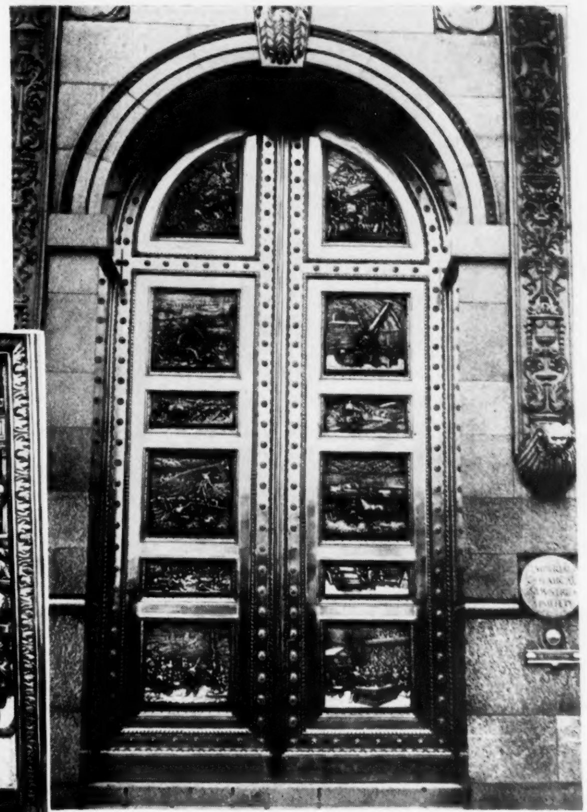
Victor Chemical Works' Engineers inspecting the phosphate rock properties of the Globe Phosphate Co., in Tennessee, prior to its purchase. The new acquisition assures Victor at least 75 years supply of phosphate rock



Chemical construction does not appear to be lagging. (Left) an exclusive picture showing the progress on June 15 in the work on the new Mellon Institute building, (above) the new aromatic chemical plant of Newport at Carrolville, Wis., while, (below) the new Bakelite plant at New Brunswick, N. J., is rapidly approaching completion

NEWS REEL

of Chemical Activities

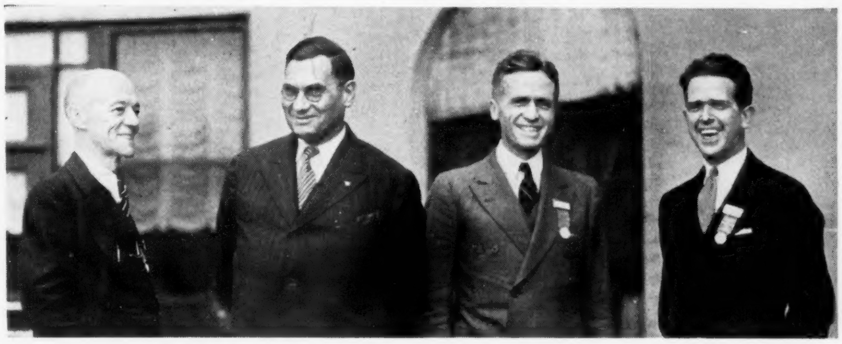


Keystone

What is claimed to be the most remarkable doorway in the world is that at the entrance to the new building of the Imperial Chemical Industries, Ltd. at Millbank in London. The history of human endeavor in industry is depicted in the panels of the doors, the weight of which are five tons. These bronze doors are fitted with an electromagnetic control by means of which the doors, are opened by pressing a switch from the inside

There are six panels illustrating the progress made by man from primitive conditions to the present era—through the application of science in industry. The one shown above, pictures a lecture by Farrady. He is chosen to represent the development of modern science because his work influenced other scientists and his personal achievements laid the groundwork for a great deal of what we now know as basic law in chemistry and physics. He fashioned the tools that modern scientists now employ

The memorial flag pole to Mr. P. D. Schenck, late president of the Duriron Co. The base of the memorial was designed by Dale Augsberger, member of the Dayton Office, and was constructed by Ray Wilt, Maintenance Foreman. The base is concrete with a tablet of highly polished cast Durimet, surmounted by a fifty foot flag pole.



Insecticide and Disinfectant Manufacturers' Association gather at the Edgewater Beach Hotel for the mid-year convention. (Above) the officers must have found conditions satisfactory to sport these smiles, (left to right) Harry W. Cole of Baird & McGuire, Inc., secretary; Robert C. White of the Robert C. White Chemical Co., president; Evans E. A. Stone of William Peterman, Inc., vice-president; John Powell of John Powell & Co., treasurer; (below) attendance was considerably above par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DIMETHYLANILINE
DINITROBENZENE
DINITROTOLUENES
TOLUIDINES
NITROTOLUENES
PARANITRANILINE
PARAPHENYLENEDIAMINE
PICRAMATE OF SODA
SULPHANILIC ACID
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It is apparent that a rational unemployment insurance, if seriously considered, must come from a mutual arrangement between employer and employee. In the absence of a remedy from this source, it is possible that a continuation of unemployment will be forced upon our industrial life. A federal or state unemployment scheme which may have a far reaching effect upon our entire economic structure. Federal unemployment insurance has the chance of stimulating the very condition that it seeks to cure, namely, more unemployment.

It has always been difficult for me to understand the logic of and the reason for the ruthless price wars which tear down the very foundation stone of industrial life. We can not hope for sound progress if the leaders of the varied industrial groups lack foresight and capacity in the avoidance of selling their commodities below cost of production. A great deal of it is going on at the present time in many avenues of trade. Bituminous coal is an example. Here is a responsibility that industry leaders cannot shirk. Their failure to correct this malady may rightfully and properly lead to government price control.

With respect to the responsibility of the individual legislator, I have attempted to give most conscientious and serious attention to that duty. I am impressed with the conviction that this attitude should be turned toward assisting the solving of our business condition. I wish to first place myself on record as being unalterably opposed to the unsound expenditure of public funds. We must not only recognize the wisdom of the attitude of our President in this regard, but we must support and encourage him. It is also well that we harken back to that period which marks the record of that steadfast and sound thinking public official in dealing with this subject in the person of our former President, Mr. Coolidge, in advocating one of the soundest of policies that has ever eminated from Sixteen Hundred, Pennsylvania Avenue, Washington, D. C., namely, economy in governmental expenditures.

We are building up in our federal state, including smaller subdivisions of government, a vast organization of officialdom which, in many instances, no doubt, indulge in useless and unnecessary expenditures of public funds, and if it is to be continued, may we not expect a just renouncement of this extravagance by the rank and file of the citizenship of this republic? Many reductions can be made without the slightest loss to the conduct of an efficient government. Millions and millions of dollars can be saved to the tax payers.

The time is at hand when every legislator, whether he be state or national, as a representative or other public official in control of the financial budget of a lesser unit should be willing to give their vote and cooperation toward retrenchment and the conservation of public funds.

I have been amazed at the proposal of those who would undertake to restore our prosperity by a drastic cut in our tariff rates. The issue is clear and undisguised. I am interested in the pay-check of the American workers. I am inalterably opposed to the bargain counters of cheap foreign goods in America. How can the flooding of this country with the products of a foreign farm and factory reduce unemployment?

I, for one, welcome and accept the challenge of those who attack the rates found in the Smoot Hawley Law that has for its purpose the protection of industries found in our own land, that they may be able to maintain a standard of wage which is in keeping with Americanism. It is today playing a part of inestimable value in shutting out low priced foreign goods at a critical time. Without its beneficial protection to home industry, nothing short of panic condition could result in this country today. I welcome the opportunity to go before the people in support of this essential legislation.

To those who insist that we should lower our standard of living to the level of foreign countries, then a low tariff policy would follow. As a friend of the American wage earner, and the American farmer, as an advocate of higher standard of living which means a higher wage for Americans, I submit that there is only one way to achieve this purpose and that is to protect our own commerce and trade from a cheaply made product of like nature of foreign nations.

Professor Donham of the Harvard School of Business Administration, points out in his able treatise "Business Adrift," in effect that we must look more and more to the American market which represents ninety per cent of our commerce and trade.

The past year has witnessed many proposals and panaceas for the problems of modern civilization. Some of these fanciful schemes present a most serious question, as they usually involve a tremendous expenditure of money and offer prospects of only negative results.

The problems that confront the legislator today are frought with obstacles intricate and unless carefully thought out before their adoption in the way of new legislation, more harm than good may come. It is easy for those in responsibility to become panic stricken and lend support to theories which may further complicate our problems as a nation of people.

The importance of problems which arise in the different branches of our national life make necessary a spirit of cooperation and team work heretofore possibly unnecessary. In other words, a clearer understanding of the other man's business difficulties makes more sure the (possibilities of the) solution of business entanglements that confront us in this period.

I trust, Gentlemen, that no obstacles will appear to darken the pathway of your progress and that we can make this land a Mecca for the world in chemical progress which is the intelligence for all things living and dead.

What Factors Control The Making Of Commodity Prices

By Floyd S. Chalmers

Dr. Arthur D. Little recently said, "There is a price at which the goods will move". But who and what determines that price? Floyd S. Chalmers, Editor, The Financial Post, Toronto, speaking before the National Association of Purchasing Agents has summarized the principal factors that effect commodity prices in national and in international trade.

WHAT makes prices? We have to consider this question from three standpoints. Let us deal first with price movements in individual commodities. Although the old fashioned law of supply and demand seems to be less in favor with our leading theoretical economists, nevertheless, I believe the law of supply and demand (which is just another way of expressing the influence of the balance between production and consumption) is the chief ruling factor in individual commodity prices.

Markets for all basic commodities are well organized in this modern world. In any of the important basic commodities, such as wheat, copper, cotton, rubber, oil, etc., there are everyday data available from every corner of the world relating to stocks on hand, supplies in prospect, goods moving into consumption, etc. Practically everyday there are new supplies coming on the market, and some known quantity is being consumed. Prices of basic commodities, in normal circumstances, are responsive almost instantaneously to each new influence and each new bit of information. International commodity price mechanism is more sensitive even than that of the stock market because of the world-wide influences that are at work.

Occasionally some man-made agency, such as a combine, a government board, an embargo or similar factor may effect a temporary influence in prices, up or down, much like a pool in a stock. But in practically every case, where such artificial interference has temporarily prevented the free impact of facts upon prices, some one has gotten scorched and usually it is not the consumer who has suffered most. During the war and after the war, there were governmental attempts to keep prices down. Since then there have been many frantic endeavors to keep prices up. In both directions, failure has resulted.

A false level of prices for a commodity is seldom international in scope. It is usually localized nationally, in which case those who think they are enjoying the benefit of the high prices fail to realize that any temporary benefit they enjoy is likely later to be paid for by themselves. They simply kid themselves. Eventually prices must find their proper level. When a false level of prices breaks, as is inevitable, no one is hurt more than the producer for whose benefit price control was designed. Effecting an artificial price stimulates production when in reality lower prices should be operating as the corrective to overproduction. If price movements are left alone by governments, producers and consumers, radical price movements over wide ranges will be reduced, international factors will rule, unpleasant situations will be corrected as they arise by natural forces, and every one will be better off.

Thanks to well organized commodity markets in practically every major basic commodity there are ample facilities for permitting every effective factor or influence to bear upon price levels of individual commodities. Thus the prices that are established are usually the right prices. If they are not the right prices, they will soon be made so by the working out of ordinary economic laws.

In finished products it is more difficult to analyze what makes prices. Costs of raw materials are only one factor. Labor costs are important. Distribution costs are very important and sometimes the chief factor.

The tendency is for new manufactured commodities to start at a high price. They are in the luxury

class. Distribution costs are likely to be high. Competition inevitably comes in. Wasteful competition, accompanied by high pressure selling and the inefficient use of such normally useful devices as installment selling and national advertising is costly. The consumer is apt to pay the major portion of the cost of wasteful competition, but he does not always pay the entire cost. The unhappy experience of investors and workers in connection with some new products is evidence of this. But it is the usual cycle for the luxury of today to become the staple of tomorrow, and to settle down to a price level that is influenced much like the price level of other commodities. When this takes place an important factor in the price is the efficiency and cost of labor. Usually the most efficient producers fix the prices.

There is always a lag of the cost of living behind the movement of commodity prices. The cost of living is largely made up of basic commodities plus charges for labor, services and use of capital. These latter factors are at least as important in the cost of living as commodity prices. Wages adjust themselves slowly. Interest charges adjust themselves slowly. The cost of services generally is less mobile than commodity prices. These charges are coming down. That being so, I expect to see what is generally known as the cost of living continue to decline for some years yet as a reflection of the rapid descent of commodity prices generally. Retail prices are coming down and the faster manufacturers and distributors can move them down the sooner will business recover. This will bring balance and equilibrium into the general price structure of the world.

So much for the factors that influence individual commodity prices. I gather that you are most interested in the general level of commodity prices and recent price movements.

Previous Price Peaks

A sudden decline in prices is not new. During the Napoleonic wars, prices were at an unprecedentedly high level and there was a very rapid decline extending to 1850. Then came general recovery, between 1850 and 1873, which you will observe was a period of gold discovery in California, Australia and British Columbia, and also a period of wars and rumors of war in the United States and Europe.

In 1873 another period of price decline started, less serious than the other and by 1896 prices had come to the lowest general level in history. This was a time of general peace throughout the world, and a time when a heavier burden was being put upon gold, both through the lack of new discoveries and the demonetization of silver throughout the western world.

In the late eighties ways were found of profitably extracting gold from South Africa's enormous deposits. In 1896 came the Klondyke gold rush. From 1896 to 1914 prices rose again. This was a period when the world was upset by some important wars such as the Boer War, the Russo-Japanese War and the Balkan Wars! It was the period when the High Cost of Living came into being.

Considering the period of one hundred years following the close of the Napoleonic wars, we find two things. First, that rising prices coincided or followed periods of gold discoveries, and secondly, that falling prices developed when no new large bodies of gold were being discovered, and when such influences as the demonetization of silver were throwing a heavier burden on gold in carrying the currency structure of the world.

Relation of Gold to Trade

This sequence of circumstances must be more than a coincidence and it is not surprising then that economists have studied the influence of gold movements on prices. They have not paid as much attention to the influence of peace and war on prices.

Gold happens to be the basis of the currency of approximately one-half of the world. The theory of it is that gold is a fixed anchor to tie to. But the actual practice of it is that gold, besides being the basis of our credit and currency structure, is a commodity that fluctuates in value in accordance with the law of supply and demand. We speak of the gold standard but a standard is something fixed and stable. An unstable standard is a contradiction in terms. As one economist has put it, gold production is a casual fact of nature and prices and human happiness are at its mercy.

Many economists feel that the basic trouble is that there is not enough gold in the world to support the tremendous enlarged volume of business that has been down at high prices since the war. They feel that as there is no immediate prospect of increase in the world's gold production—Canada's notable development not serving entirely to offset the decreases in production in South Africa and elsewhere—it will be necessary to have a tremendous scaling down on the prices of everything in the world—as measured by gold—in order to permit the world's comparatively small stocks of that metal to support a much deflated structure. As we have all seen, such a process of deflation is a very distressing one, and it is not surprising that much ingenuity is being displayed in the working out of plans whereby the influence of gold shortage or money shortage—if either really does exist—on prices may be alleviated.

It is suggested that the world's bankers might be able, by adjustment of interest rates and loaning facilities, to re-distribute the world's gold to better advantage in order that it should not be largely concentrated in two countries.

Another plan offered is for the internationalization of gold reserves, in the hands, say of the Bank for International Settlements, so that there would be little movement of gold between countries, but permitting balances to be settled largely by ledger entries.

It is also suggested that central banks might lower their gold reserve standards to offset gold scarcity.

Still another plan offered is the remonetization of silver as a substitute for gold with the establishment perhaps of a definite value ratio between silver, such as twenty to one.

In any event none of these plans involve the abandonment of the gold standard. No matter how untrue the gold standard may seem to have been to us the weight of economic opinion is in favor of sticking to it and adapting our ineffective world monetary system to it.

Of course, it is possible to exaggerate the influence of gold. The quantity theory of gold should not be blindly accepted. In the United States commodity prices prior to the decline in 1929 had done little more than hold their own for several years, although gold reserves rose to record levels. If gold were so important a factor, commodity prices should have risen sharply. In fact, when the League of Nations appointed a committee to study the influence of gold production on price the report that was published was inconclusive. Gold was on trial on the charge of running prices up and down and the jury brought in the Scotch verdict, "Not Proven."

The question really must be viewed in the larger sense of the influence of the supply of money on prices. Then you say, if a shortage of money is the cause of the decline in prices why can not we create more money and restore prices ? Well, we have seen what easy credit (inside tariff and immigration walls) did in creating prosperity and inflation on this continent when the rest of the world was still sick from the strain of war. And we have seen what a painful process it is to get back to balance with the rest of the world. With money rates at new lows, it cannot be said that money or credit is scarce. There is plenty of it but is not going where, in this distressed world, it is most needed.

Frozen Credits Block Business

But credit is not being employed internationally, due to some extent to the frozen nature of post-war obligations, including the international political obligations of which we hear so much. Due to the barriers of trade that have been set up, such as unduly high tariffs, and due also to extravagant expenditures by all governments, particularly on armaments, the channels of world trade have pretty well frozen up. We need some powerful icebreakers to get to work.

Tearing down some of the barriers of a free flow of international securities and of the world's working capital is an essential. If this involves some ultimate scaling down of international political obligations, then I am sure that business men and bankers can bring sufficient pressure to bear to effect this. But merely writing off political debts without reforming national extravagance or rebuilding the international monetary and banking system would be useless.

Periods of rising prices coincide to some extent with periods of monetary aggressiveness throughout the world. Wars mean waste. During periods of war a vast amount of commodities are destroyed without being paid for. The debt incurred is placed upon succeeding generations. The world goes on one grand spree of consumption, wasteful consumption of practically every type of commodity, without assuming the financial burden fairly involved. Thus there is a great period of consumption of commodities with a rising influence on prices which must be followed by a period in which the world is so busily engaged in paying the cost of the spree that the power of the current consumption is definitely curtailed. Thus a price decline with its unsettling influences on business, must be regarded as one of the prices we pay for human hates and vengeances.

Factors Affecting Prices

One thing that makes an analysis of commodity price movements difficult is that the ordinary factors that influence prices have been operating simultaneously with the basic factor of gold and money values that we have been discussing. Thus the general decline has been uneven; some commodities have fallen much more than others. It is difficult to keep any one commodity in perspective.

Allow me to mention some other factors that have operated to greater or lesser degrees to influence prices, whether of commodities as a whole or of different basic products. One is the technical progress that has been made by modern science. For instance, various mining processes have been devised that have brought into production low grade ore deposits, before older and more expensive deposits have been worked out. Cheaper methods of extracting nitrates from the air and similar processes have served to increase the available supplies of commodities and at lower cost.

The increase in world production in the field of agriculture by mechanization must be recognized. Mechanization of farms has increased production. It has done more; it has replaced thousands of horses that were formerly consumers of cereal products. The reduction of costs effected through the use of machinery has enabled what were formerly marginal lands to be brought into production. Modern farm implements help out the consumer and they benefit farmers who know how to use them, but they create problems

for the rank and file of agriculturists throughout the world.

The growth of nationalistic spirit following the war has put each country in the position of wishing to be self-sufficient. This has undoubtedly stimulated production, and curbed consumption. Even Russia has followed suit. In many basic commodities a vast overproduction has resulted. When I speak of overproduction I am not overlooking the fact that throughout the world there are enormous numbers of people who are suffering from a lack of the ordinary commodities of commerce, and that the world could theoretically consume much more than it can possibly produce with its present productive equipment. By overproduction I mean a production of various commodities in excess of what the world's distributing machinery can, under present fiscal and monetary policy, put into consumption.

There has been a slowing down of the rate of population increase in the world, which has reduced consumption at a time when the use of man power substitutes such as machines have prevented this lower rate of population growth from reducing production. Various artificial attempts to hold up prices have delayed the effect of price reduction and have made the crisis worse.

With good sound financial management on a world basis, prices could be stabilized well above present levels and prosperity throughout the world speedily restored. I do not know that a general rise in prices is essential to a recovery in business. That is the economic theory that most of us have gone on. In the case of a single country, rising prices would stimulate business.

What is more essential for the world at large is price stability.

I think the deflation of commodity prices has proceeded to an unreasonable degree. This is certainly true of many groups. Economists, whose opinion I respect, have stated that they believe prices have about touched bottom, although individual movements will undoubtedly be noticed. That, of course, is a different thing from saying that equilibrium has been restored. Prices of basic raw commodities may have touched bottom without the necessary following adjustment being made.

One of the factors what will need some adjustment is the factor of wages. We may even see some considerable deflation in urban land values similar to what is taking place on the farms of the world. The prices of securities generally have deflated in accordance with the new level of values.

Adjustment will go on, and the sooner adjustment of all factors to present commodity levels has been effected, the better for business. With equilibrium restored to some extent we can have a broad upward movement in business—though not leading to inflation—without necessarily rising prices.

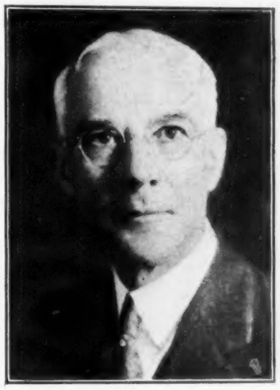
Give us surcease from artificiality and we will end our price troubles.

Association News

June was distinctly a convention month. The Insecticide & Disinfectant Manufacturers' Association held its mid-year meeting on June 1, 2, and 3, at the Edgewater Beech Hotel in Chicago, The National Fertilizer Association met at White Sulphur Springs during the week of June 8, the Manufacturing Chemists Association members gathered together at Absecon, June 4, and the following day held a joint meeting with the Synthetic Organic Chemical Manufacturers Association, and on June 10, 11, and 12 The American Institute of Chemical Engineers met at Swampscott. In the purchasing field the National Association of Purchasing Agents h:ld a most successful meeting at Toronto on June 8 to 11.

Manufacturing Chemists At Absecon

At the Manufacturing Chemists meeting the most important subjects under discussion were the general business situation, the tariff act of 1930, the revision of the Interstate Commerce Commission of the regulations covering the transportation of explosives and other dangerous material and also several different phases of the present industrial alcohol problem.



S. W. Wilder
Retiring Chairman

The new officers elected were: President, Lammot du Pont, E. I. du Pont de Nemours & Co., Inc.; vice-presidents, William B. Bell, American Cyanamid Co. and Edwin M. Allen, Mathieson Alkali Works; treasurer, J. W. McLaughlin, Carbide and Carbon Chemicals Corp.; executive committee, Warrener E. Huntington, Davison Chemical Co., chairman, Charles W. Millard, General Chemical Co., H. L. Derby, Kalbfleisch Corp., T. E. Doremus, Grasselli Chemical Co., Leonard T. Beale, Pennsylvania Salt Mfg. Co., G. W. Merck, Merck & Co., and Charles Belknap, Merrimac Chemical Co.; executive secretary, Warren N. Watson.

Two outstanding addresses were made at the meeting, the first by William J. Hale, director of organic research for Dow Chemical and the second by Senator Henry D. Hatfield at the dinner given on the evening of the second day and presided over by Dr. E. H. Killheffer of Newport. (Both addresses are given, Dr. Hale's, "The Chemical Road to Progress," on page 21, and Senator Hatfield's "Politics and Chemistry" on page 31.

At the dinner S. W. Wilder, Merrimac, and retiring chairman of the executive committee was honored with the presentation of a bound volume of testimonials from the various members of the association attesting to his important services during the thirty years of activity in the Association. August Merz, president of the Synthetic Organic Association announced that that body had made Mr. Wilder an honorary member.

Second Golf Tournament

The second golf tournament of the Salesmen's Association of the Chemical Industry will be held on July 22 at Lennox Hills Country Club, Farmingdale, L. I. The charge will be $5.00 for members and $7.00 for guests, including greens fees and prizes. Lunch and dinner can be paid for at the club. This outing will be under the direction of Thomas R. Farrell, DRUG MARKETS, 101 W. 31st Street, New York, with whom entries must be filed by noon, July 21.

Can Pricing Be Scientific?

By Leverett S. Lyon*

One need not agree entirely with Leverett S. Lyon's conclusion that price has little direct relationship to costs in order to find this article, first given as an address at the convention of the National Association of Purchasing Agents, a thoroughly convincing arraignment of present methods of determining sales prices.

CAN there be scientific pricing by a manufacturer? I am certain that many of you will have many cases of methods used in price-making which have never come to my attention. I feel reasonably confident, however, that price policies of manufacturers, and the scientific efforts which they can employ in making them, fall into three classes.

There is a class of manufacturers who produce a standard commodity which they make no effort to distinguish by brand, the qualities of which are well known to the trade—indeed it may be bought on specification—and where the quantities produced are dependent upon orders received in competitive bidding. Over the price at which he sells such commodities, the manufacturer has comparatively little control. He may ask any price, but he cannot get it. He sells in a market almost as competitive as the commodity exchanges.

So far as he can exercise any scientific method, it is in keeping himself informed of the costs and prices of his competitors so that he will not sell lower than he needs to sell and in skill in knowing his own costs so that he will not take orders at a loss.

His profits, if any, are to be made by keeping his costs down. They cannot be made by marking his prices up.

This manufacturer may take one other step and apply to it some of the activities which we speak of as science. If he is desirous of greatly expanding his output, he may lower his price below the market. Is this a scientific thing to do? It may be a wise thing to do, if he is confident that he can by so doing so increase his sales that his total net return will be greater. The scientific aspects, if any, will come in his efforts to ascertain whether this is the case. This will involve, of course, a scientific appraisal of the possible reduction of overhead and possibly of direct cost per unit, growing out of increased sales and scientific analysis which may enable him to determine what his increased sales at the lowered price may be. To the extent that he does these things scientifically, he will be engaged in applying scientific method to his price-making policy

A second class of manufacturer is he who, through a patent or some other fortunate situation, enjoys a monopoly. The problem of science for this manufacturer is to determine—as expressed in the well-known law of monopoly price—that price at which he will secure the greatest net return. This is by no means usually the highest price. As prices are increased, sales will usually fall. If they are lowered, sales may be expected to increase. The rate of this decrease or increase of sales varies with the character of the demand for the commodity and the possibilities of substitutes. Science, perhaps in the form of experimentation, or in other forms which analyze demand, can go no farther in this case, and appears to have no

*Institute of Economics of the Brookings Institute, Washington, D. C.

other form than to help the manufacturer determine the price at which total sales multiplied by profit per unit will yield the greatest total. Obviously in this case science will be needed in cost accounting to determine the cost and profit per unit of producing various quantities; and science, or at least judgment, should be applied to a consideration of the price at which competitors will be attracted into industry, or may lead to demands for government interference.

Marketing Packaged Articles

A third type of manufacturer and one which is very common in the modern business world is he who attempts to distinguish his product, either actually or in the mind of the buyer, from the run of mine of similar products. This may have a material basis, as in some slight patent, or it may be a difference chiefly accomplished by brands, trade-marks, or packages which enable the manufacturer to identify it and to lead the buyer to believe that it has some measure of superiority.

In pricing such a commodity, there is a problem similar to that found in monopoly price but usually in a very much modified form. The advantage, real or imaginary, which this product has will make it possible for the manufacturer to price it somewhat higher than similar commodities. How much science can he bring to bear in helping him ? One area in which he may attempt to apply science is in seeing, how far he can differentiate it from others; that is, how far he can make it to be, or make people believe it to be, different from other articles. A second and related area in which he may apply science is in his market analysis. To the extent that he applies science in determining how much of his product can be sold, where it can be sold, and to what extent it enjoys a preference over competing articles, he is doing what science can do in price-making. A third area for scientific study is advertising and other sales effort In applying science to a study of color, line, design, and copy which lifts his article out of the competing class, he is applying science to making his prices. So too, of course, with costs. The more scientific his cost system, the better he will know at what prices various quantities can be produced and, therefore, the better he will know the possible net profits from various sales of various quantities at various prices.

His problem, in other words, is that of the manufacturer with a monopoly, except that he has the problem in a very modified form. For the manufacturer we may conclude that the assumptions and the efforts toward science in pricing mean very different things from their meaning in either of the other cases. The assumption here is of an individual with a large amount of control over his product and his output and who usually fixes his offering prices for a considerable period, striving to determine the price which will yield him the greatest net return. The application of scientific method comes in such a study of costs and markets and the methods of making buyers buy as will help in making the net profit large.

So far as I can ascertain, cost is never for a manufacturer a wholly satisfactory base upon which to figure prices. Goods in the market are worth and will sell for what they will bring, and this has no relationship to the costs of an individual manufacturer. Costs determine the minimum price at which one can sell for a profit; and so far as a going business is concerned, they seem to be valuable chiefly from that point of view. If competition is severe, even costs cannot be secured. As every manufacturer knows, he has sold below cost temporarily, or on forced sales, or he has observed cases where liquidating prices, which do not bring even direct costs, were better than no prices.

Still costs remain, in the minds of many manufacturers, of great consequence. There is a sort of feeling that costs are the bedrock from which to build. Some manufacturers believe that a straight mark-up from costs and one which results in a constantly lowering price, if costs go down, is the safest and best policy. Perhaps it is in certain cases. Other users of cost disagree as to what costs should be counted. While some enumerate at length the types of costs which must be included, others are inclined to say, figure profits on direct costs; the volume thus secured must take care of the overhead. In the history of railroad rate-making, this policy has not been unbroken; nor does it have a record of great success.

On the other hand, not a few manufacturers wish to know costs so that they will know when they are selling at a loss, but their price-making begins at the other end.

The question which they put to themselves is, what can we sell this product for, or how many of this product can we sell at certain prices ? It is to this problem that they first apply that form of analysis which we are likely to call science. If they conclude that what they call "a satisfactory quantity" could be marketed at one or at several prices, they work backward to determine the costs at which they can buy or make the article in those several quantities. If the margin of profit is satisfactory, they decide to proceed.

Science of Pricing is Lacking

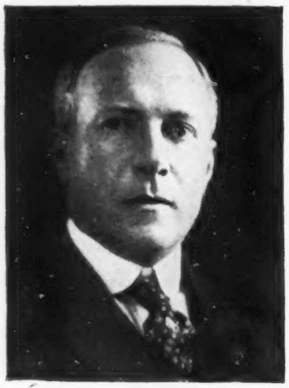
In summary, it seems to me safe to say that we have no science of pricing, though we have in a series of areas, scientific activities which enormously help in the process of pricing. Yet in these areas our assumptions as to what is a proper basis for a proper price and the activities which we perform which we think of as scientific vary widely.

In certain ideal worlds it might be scientific experimentation solely. In railroads and public utilities we have tried with imperfect success to reach scientific pricing through scientific valuation. We have there

assumed, at least for certain prices, that value was a sound basis and have applied scientific effort to evaluating. In the commodity exchanges we totally disregard the concepts of cost when we try to be scientific but set up a series of devices which we believe will fix a price which will "just clear the market" and no more. Whether this price gives cost, or less, or more, is not considered. In manufacturing we have a series of situations highly competitive, highly monopolistic, and semi-monopolistic, and in these, science is not applied by some general and outside agency but rather by individuals. These individuals use scientific procedures at those points and in those ways which they believe will help them in ascertaining and carrying on the methods of selling that quantity at that price which will return the greatest net profit. Science, what variations are committed in thy name!

N. F. A. Holds Important Session

The National Fertilizer Convention held at White Sulphur was one of the most important held in the history of the industry. It is not difficult to understand this when consideration is given to present business conditions and the situation in the agricultural centers. A precedent of many years was broken when no outside speakers were invited to speak at the meetings. The sessions were given over almost entirely to the transaction and discussion of the problems pressing for solution.



L. W. Rowell
Retiring President

The first general session was held on Tuesday, June 9. L. W. Rowell, of Chicago, president of the association and vice-president of Swift and Co. sounded the keynote of the convention in his address on "Practical Problems of the Fertilizer Industry." He was followed by Charles J. Brand, executive secretary and treasurer of the association, who spoke on "The Industry and the Association: An Appraisal." H. R. Smalley, director of the association's soil improvement work, discussed "Research and Demonstrations: The Foundation of Progress."

Attendance at the meeting was not up to that anticipated. However those that did felt that the situation had been clarified to some extent and that with any return to normal that conditions would improve.

The new Board of directors met immediately following the adjournment of the convention and elected Bayless W. Haynes, Jacksonville, Fla., President, John J. Watson, New York City, Vice-President, and Charles J. Brand, Washington, D. C., Executive Secretary and Treasurer. New members elected were Empire State Chemical Co., Athens, Ga., and Merchants Fertilizer & Phosphate Co., Charleston, S. C.

A company has recently been organized in Berlin, with a capital of 54,000 marks and with the title "Das Deutsche Bromsalz-Syndikat G.m.b.H." Its objects are said to be "the coordination of the general interests of companies engaged in the sale of potassium bromide, sodium bromide, and ammonium bromide, and the regulation of the market for these salts." It is thought that this may possibly be the first step in the formation of an International syndicate.

Chemical Engineers To Meet In England

The past meeting of the American Institute of Chemical Engineers was featured by a joint session participated in by the Process Division of the American Society of Mechanical Engineers. It is thought quite probable that this custom may be continued at subsequent meetings as both groups have a great deal in common.

Carlos E. Harrington presided at the joint meeting of the two groups on Friday morning, June 12, at which papers were presented by E. M. James on "The Continuous Centrifugal and Some of Its Applications," and by Clarence Birdseye on "Certain Chemical Engineering Aspects of the Fisheries Industries."

In addition to a group of papers dealing with the industries of New England two groups of three papers each discussed new work on the problems of heat transfer. The first group, from Massachusetts Institute of Technology, presented the work of Drew, Hogan, McAdams, and Ryan dealing primarily with the general subject of heat transfer between tubes and fluids moving around them. The second group, having to do with the heat transfer characteristics of packed and baffled tubes, was based on work done by the Du Pont Experiment Station group and presented by Allan P. Colburn, Thomas H. Chilton, and W. Julian King. The material brought forth by these papers and the discussion following was deemed of such importance that a round-table conference on the subject has been arranged for.

It was announced that the summer meeting of 1932 will be held with the Institution of Chemical Engineers in England. The details so far arranged for this trip were explained to the members and sixty have signified their intention of attending at this early date.

Copper Price Forcing Curtailment

Should the present price of copper now fluctuating around 8½ cents remain at this figure for a few months longer it is quite probable that it will result definitely in further curtailing the activity of a large number of copper producing companies. It is reported from reliable sources that producers of over half of the World's present monthly output of 250,000,000 pounds cannot break even even with only operating costs considered when the price of the metal goes under 8½ cents delivered. This does not take into consideration the question of depreciation.

Some of the large operating companies have shut down. United Verde (8,000,000) and Magma 2,400,000 pounds monthly, the first indefinitely and the second for at least six weeks. United Verde Extension has announced a 90 day suspension. It is not thought necessary in market producing circles for the price to go below eight cents to bring about further curtailment and therefore equilibrium to the industry. In some circles, however, the belief is held that this is necessary to force out the high cost producers and to move the tremendous surplus which with each succeeding month has gone to higher and higher figures. In figuring costs of copper production it must be borne in mind that wages in the industry are based on the cost of copper and with the present level wages so low producers such as Anaconda are producing copper at the lowest price yet reached. On the other hand carrying charges and other fixed charges are falling on a restricted output.

It is thought that a large part of present manufacturing activity will be cut off in the next few months. Recourse to a study of the various cost levels points that way. One estimate, that is thought to be very reliable, is shown below, and if this basis is correct, the copper industry should show some indications of change very shortly.

Operating Costs Only Without Depreciation

	Monthly output short tons	*Annual rate short tons*	*Percentage of total*
Mines at 8c or under	41,500	498,000	33.2
Mines probably between 8 and 9c	26,700	320,400	21.4
Mines above 9c	44,500	534,000	35.6
Output unaccounted for	12,300	147,600	9.8
Assumed total production	125,000	1,500,000	100

Synthetic Resins*

Their Newer Specialized Uses

By W. H. Nuttall, F. I. C.

IN SYNTHETIC resins we have an entirely new class of commercial products which are constantly finding fresh applications and uses.

In the first place, it is important to note that, speaking generally, up to the present, synthetic resins are not to any very great extent replacing the use of natural ones. The extremely rapid growth of the use of synthetic resins is mainly due to the fact that most of them possess one extremely valuable property lacking in the natural resins, with the possible exception of shellac. I refer, of course, to the thermo-hardening properties of the synthetic resins.

Resins of the phenol-formaldehyde, urea-formaldehyde and thio-urea-formaldehyde types all owe their value to the fact that the effect of heat is first to fuse them and then to harden them to an infusible solid. They form, therefore, the ideal basis of moulding media. By mixing these resins with suitable fillers, usually wood-flour and pigments, moulding powders are produced, which on introducing into a polished die, and pressing in a press for a few minutes at a temperature of 130—180°C. give a moulding of exquisite finish, of intricate design, if necessary with metal parts moulded *in situ*, and of a variety of colour effects. Because during the moulding process the resin has fused and then hardened to an infusible solid, the mouldings can be removed from the hot moulds without fear of warping, so that the process is well adapted for rapid production of multiple parts. One of the main outlets of synthetic resins of the phenol-formaldehyde type is in the manufacture of moulded parts of all descriptions: wireless components, such as the bases of valves, insulating parts, wireless cases, ash trays, knife handles, clock cases, etc.

The thermo-hardening properties of resins of the phenol-formaldehyde type also find another application in the manufacture of laminated sheets, having either a paper or cloth base. Suitable paper is passed through an alcoholic solution of a phenol-formaldehyde resin, and the solvent removed without the application of excessive heat; if a large number of sheets of paper, so treated, are superimposed and pressed between metal sheets in a hydraulic press at a temperature of 130—180°C., fusion and subsequent hardening of the resin takes place, and a sheet of hard compact material results. Such a sheet, when properly prepared, possesses exceptional electrical properties, and apart from its use as "Bakelite Sheet," known to every wireless amateur, finds very extensive application in the manufacture of high-tension electrical plant, especially in transformers, where its oil-resisting, and heat-resisting properties are of special advantage.

Further, if such treated paper is produced in a continuous length and is wound round a hot mandril in a suitable tube-winding machine, and the mandril is then baked, preferably in a mould, a tube of either circular or rectangular section is produced. Such tubes are very largely used in switchgear, owing to their good electrical insulating properties. Or, again, the paper treated with the synthetic resin may be employed for the manufacture of what are known as condenser bushings, used for insulating high-tension leads from transformers, switchgear, etc. Unfortunately the insulating properties of an electrical insulator do not increase progressively with the thickness—doubling the thickness of an insulating tube does not double its insulating power. Actually, with the high-tension currents at present in vogue—say, 50,000 to 100,000 volts, it is difficult to find an insulating medium which can withstand such a voltage. The difficulty has been overcome by winding a laminated paper tube and inserting, at carefully calculated intervals, pieces of tin foil of specified size. We have, really a series of concentric condensers of approximately equal capacities, the thickness of the laminated paper layer being such that the insulator is not unduly stressed.

Or, instead of using paper for impregnating with an alcoholic solution of the synthetic resin, cloth may be employed, and by heat pressing a pack of superimposed sheets, a laminated cloth material results, which is exceptionally hard and strong, and is largely replacing hide for silent pinions.

A further application of the thermo-hardening properties of this type of synthetic resin is its use as an

*Read before the Yorkshire Section, Society of Chemical Industry.

electrical impregnating varnish. Cotton-insulated wire is largely used in the form of windings in the production of electrical plant. From an electrical standpoint, cotton is an extremely hygroscopic material, so that it is necessary to dry out the cotton and seal it from atmospheric changes by means of a suitable varnish. The rotor of a dynamo, for example, is dried out *in vacuo*, then flooded with varnish, allowed to drain, and then the varnish dried by baking. Oil varnishes are largely used for the purpose, but oxygen is necessary during the baking process to convert the liquid linseed oil to the solid linoxyn. With a large unit it is extremely difficult to get complete oxidation in the interior; too often we get complete oxidation only at the outside, the varnish in the inner recesses being in only a semi-solidified condition. The result is that on revolution the semi-liquid portion tends to spew out. If a synthetic resin varnish is used for impregnating purposes such a difficulty does not arise. No oxygen is required to harden the resin situated within the rotar; heat treatment alone suffices to convert the resin into a hard infusible and insoluble mass.

I think the above forms a rough summary of the main uses of synthetic resins of the phenol-formaldehyde type. This name, of course, is largely a generic one, since cresols, on account of cheapness, are frequently used in place of phenol, and the properties of the resins produced can be regulated by the type of cresols used.

So far as this country is concerned, the synthetic resin next in importance to the phenol-formaldehyde type is that manufactured from thio-urea and formaldehyde. These two chemicals readily condense together in presence of a catalyst—usually a very dilute acid—to give a resin soluble in water, but insoluble in most organic liquids. It has thermo-hardening properties and can be readily moulded. It is the basis of the well-known Beatl ware. Up to the present this is its main application.

Applications Urea-Resins

Urea also readily condenses with formaldehyde giving a transparent, almost colourless glass-like resin. Its manufacture has been developed in Austria under the name of Pollopas, and attempts have been made to exploit it in England for use as windshields, as, when fractured, it does not readily splinter. I believe, however, that considerable technical difficulties have been encountered in producing sheets with plane surfaces, and there seems but little possibility of its becoming a serious competitor to the laminated glass, such as Triplex, now so largely in vogue.

In glyphthal resins we enter upon an entirely different class from those hitherto considered. They are formed essentially by the condensation of glycerol and phthalic anhydride, but their hardness, flexibility, etc. can be modified very considerably by the incorporation of an organic acid, such as succinic. They form clear transparent resins, but their application as such is somewhat limited owing to the high temperature required to convert them into the insoluble and infusible form. This temperature is considerably higher than that of the charring point of cellulose. This naturally precludes their use as bonding agents for either paper or cotton.

However, by the incorporation of heat-hardening resins with the glyphthals, there is obtained a series of artificial resins, which readily harden under heat treatment. The flexibility and hardness of the baked resin can be varied within wide limits. Thus, for example, we have a lacquer suitable as a varnish for rubber and rubber leather cloth. It is applied to the unvulcanized material, and on stoving vulcanization of the rubber and hardening of the resin take place simultaneously.

Another lacquer gives a considerably harder and less flexible film, and finds a ready application to metals as a clear finish.

Other lacquers are being widely used as thermal-hardening light-fast enamels.

Substitution for Shellac

Glyphthal resins are replacing to some extent the use of shellac as a bond in the manufacture of micanite, in which flakes of mica are superimposed and moulded to any desired shape. Micanite is employed as an electrical insulator, where high temperatures are likely to be encountered, so that the comparatively high temperatures, which the glyphthal resins are capable of withstanding, render them very suitable for making micanite.

The glyphthal resins are also finding a useful outlet in the preparation of coloured lacquers for electric-light bulbs.

The cumar range of resins is usually classified as synthetic, though actually the resins are obtained as a by-product in the purification of coal-tar naphthas. Such naphthas, in the impure state, contain considerable quantities of indene, coumarone, and similar unsaturated compounds. If such naphthas are agitated with sulphuric acid without allowing the temperature to rise, the unsaturated compounds undergo polymerization to resins, which after removal of the acid and washing can be separated from the naphtha by distillation. A whole range of cumar resins of various melting points and grades of colour is now available, and finds an outlet in the manufacture of oil varnishes. We have here an instance of a synthetic resin replacing the natural gums over which, they possess one marked advantage. A natural gum, such as copal, is not soluble in linseed oil without a preparatory heat treatment, technically known as "running." During this heat treatment there is a considerable loss in material, and unless great care is

exercised undue darkening results. Cumar resins are directly soluble in hot linseed oil without any pretreatment, so that the process of varnish making is greatly simplified. I believe that wood-oil varnishes, made up with cumar resins, have proved fairly satisfactory, though it is too early to say whether such resins will eventually replace the natural gums.

Another instance where synthetic resin has been used to replace the natural gums for varnish making is that of the Albertol range. A phenol-formaldehyde resin, though readily soluble in its unpolymerized state in alcohol, acetone, etc., is insoluble in benzene, naphtha, and paraffin hydrocarbons. This is doubtless due to the presence of hydroxyl groups in the molecule of the resin. If, however, these hydroxyl groups are esterified, then the resin becomes soluble in the usual varnish vehicles. The Albertols are synthetic resins of the phenol-formaldehyde type, the hydroxyl groups of which have been esterified by abietic acid from colophony. They are being actively pushed as substitutes for natural gums in varnish-making and have, I believe, achieved a certain measure of success.

Direction of Further Advances

The rôle of a prophet is always a dangerous one, and it is always difficult to indicate with any degree of certainty the directions in which improvements and advances are to be expected. I venture to think, however, that advances in the synthetic resin industry may reasonably be anticipated in at least two main directions:—

(1) In the production of resins to replace copal, kauri, and other natural gums now used in the varnish and lacquer industry. I have already instanced two cases, the cumar and the Albertol resins, and now that the theory of resin-formation is being better understood other oil-soluble resins will most probably be forthcoming.

(2) In the production of resins specially designed to meet the varied requirements of the electrical industry which, at the present time, forms the main outlet for synthetic resins. At the present time the characteristic of an insulating material in which an electrical engineer is most interested is its specific inductive capacity, or its permittivity, as he prefers to call it. In certain cases, as in the manufacture of condensers, the engineer requires a high permittivity; in other cases he demands as low a permittivity as possible, because with modern high-tension alternating current a high permittivity can, under certain conditions, lead to very serious power losses. His requirements in these two directions have not hitherto been met, but now that we know from Debye's work that the main factor in the production of high permittivity is the presence of a polar molecule or "dipole" it may safely be assumed that synthetic resins of definite permittivities will be forthcoming.

Government Bulletins

335 Quicksilver; by C. N. Schuette. 168 p. 56 illus. 45c.

Report of the study of the production of quicksilver, the principal aspects of which include developing and mining of the ore bodies, the metallurgy of quicksilver ores, and the economics of the industry as a whole. Discusses and illustrates types of equipment and underlying principles of operation. (Obtain from Supt. of Documents).

6437. Magnesite; by Paul M. Tyler. 63 p.

Gives information on uses, methods of mining and treatment, brickmaking, production, imports and exports, consumption and supply, and markets and prices. Contains bibliography and lists domestic producing manufacturers of magnesite brick, and magnesite importers and dealers.

6486. The significance of solvent analysis as applied to coal; By E. B. Kester.

Notes that fair comparison of systems so far evolved for solvent analysis of coal is almost impossible, due to wide variations in samples, conditions, and methods employed. Moreover, little stress has been laid on correlation of coal extracts with properties of parent substance other than its coking properties. Bibliography containing 27 citations is appended. (Obtain from Section of Publications, Bureau of Mines, Washington, D. C.

Company Booklets

Diamond Alkali Co., Pittsburg, Pa. has continued its recent series of attractive leaflets stressing various points of particular interest to users of alkali and chlorine. The latest in the series was mailed June 1. Those desiring to be placed on the mailing list may do so by applying directly to the company's offices.

A supplement to the attractive catalog issued by The Kalbfleisch Corporation is now off the press. It is in itself an indication of consistent expansion, for it gives complete information concerning various new acquisitions, new plants, recent developments in the production, handling and delivery of Kalbfleisch chemicals.

It constitutes a splendid handy reference book for the wide range of chemical substances which this company manufactures. Copies of the supplement or the complete catalog and supplement may be had on request to The Kalbfleisch Corporation.

To meet the increasing number of requests from chemistry classes of schools, colleges and training laboratories for technical data, a new chart "Important Uses of Industrial Alcohol" has been prepared by U. S. Industrial Alcohol Co. for general distribution.

This new chart of the "tree" type traces the varied uses of industrial ethyl alcohol. It shows graphically its use as a raw material in chemical processes . . . as a solvent for innumerable purposes . . . as a general utility medium, and its miscellaneous and domestic uses.

Printed on coated paper size 11 x 17 inches, this chart is ideally suited for display and reference purposes. Copies will be furnished by writing the U. S. Industrial Alcohol Co., 60 East 42nd Street, New York, N. Y.

Roessler & Hasslacher Chemical Co., Empire State Bldg., New York City, has just released the third edition of the "Service Manual" for Artic, Artic N, Methyl chloride A and methyl chloride AN. Copies may be obtained at any of the numerous R & H offices.

The National Safety Council, 20 North Wacker Drive, Chicago, Ill., is now issuing the 1931 edition of "Industrial Accident Statistics". Copies may be obtained by writing T. A. Burke, Director of Publicity.

The Textile Color Card Association of the United States, 200 Madison Ave., New York City has issued the fall color chart for woolens and leather and fabrics for shoes.

Rossville Commercial Alcohol Co. is continuing with its monthly series of uses of alcohol in industry—the last is entitled "Alcohol in Beauty Culture."

Acetic Acid from Acetylene

(Part II)

An Abstract Review of the Patents Covering the Manufacture of Acetic Acid from Acetylene by Synthetic Processes

*Dr. Charles E. Mullin**

DURING the past about twenty-five years, a great many patents have been issued covering the synthesis of acetic acid from acetylene, by way of acetaldehyde.

The reader will notice that most of the patents have been granted abroad and there are a number of reasons for this. Before the war, there was not nearly as much chemical research in America as at present. The principal interest in synthetic acetic acid originated during the war, and undoubtedly the greatest need for acetic acid at that time was by the Central Powers, of which Germany was the leader. After the United States joined the war, and the patents of the Central Powers were taken over by this country, no further patent applications were received from that part of the world. Furthermore, it must be remembered that it costs more to secure a patent in the United States than in most other countries, and that our patent laws, and their application, differ quite widely from those of other nations, so that in many cases it is not possible to secure a United States patent covering the identical process as that covered by the foreign patent. Undoubtedly much of the synthetic acetic acid made in the United States at the present time is manufactured partially or entirely by processes not now covered by American patents. The following patents are grouped together under the commercial interests which control them, and are arranged chronologically in these groups. As mentioned in the previous paper, the first patents along this line were those issued to the Jonas group.

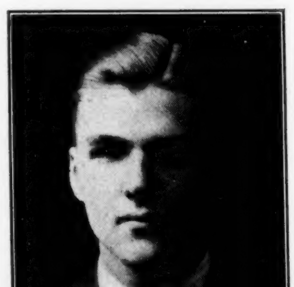
The Jonas Patents

French Patent No. 360,180, February 15, 1905, to M. J. A. Jonas, M. L. Desmonts, L. P. I. Deglatigny, and L. A. Dubose, covers the preparation of synthetic acetaldehyde by passing acetylene gas into a solution of a normal mercuric salt to precipitate mercury acetylide. On heating a solution containing mercury acetylide, to its boiling point, the acetylide decomposes, liberating acetaldehyde and regenerating the mercuric salt.

French Patent No. 360,249, February 17, 1905, to the same inventors, provides for the oxidation of the acetaldehyde, prepared according to the method outlined in the preceding patent. The aldehyde may be oxidized, either directly or by catalytic agents, to acetic acid.

Chemische Fabrik Griesheim-Elektron Patents

German Patent No. 250,356, February 16, 1910 to N. Grunstein, covers the manufacture of acetaldehyde and its condensation and polymerization products from acetylene. The acetylene gas is passed into a solution of a mercuric salt containing 15 to 30 per cent of sulfuric acid, preferably at a temperature of 15 to 25° C., and always below 50° C.



*Dr. Howard L. Hunter**

German Patents No. 253,707 and No. 253,708, March 10, and January 28, 1911, additions to the preceding patent and to the same inven-

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tor specify that in the manufacture of acetaldehyde and its condensation and polymerization products from acetylene, according to the principal process previously described, the sulfuric acid may be replaced by other inorganic or organic acids, if the concentration of the acid is correspondingly higher, and the acetylene is introduced at a correspondingly lower temperature.

German Patent No. 267,260, March 10, 1910, an addition to the two previous patents to N. Grunstein, specifies that the absorption of the acetylene, and all of the later stages of the process, take place in an atmosphere of acetylene. The purpose of the acetylene is to prevent as far as possible the polymerization of the aldehyde.

German Patent No. 261,589, March 25, 1911, to the Chemische Fabrik Griesheim-Elektron and N. Grunstein; French Patent No. 440,658, February 26, 1912, to the Chemische Fabrik Griesheim-Elektron; and British Patent No. 17,424, July 31, 1911, to G. W. Johnson, for the Chemische Fabrik Griesheim-Elektron, cover the oxidation of acetaldehyde in the presence of acetic acid, a chlorine derivative of acetic acid, such as mono-, di-, or tri-chloroacetic acid, acetic anhydride, or the homologues of these compounds. In an example, air or oxygen is introduced, while agitating, into a mixture of 200 kilograms of glacial acetic acid and 10 to 20 kilograms of acetaldehyde, at 70 to 100° C. When the majority of the aldehyde has been oxidized, more is added. An alternative method consists of distributing acetic acid over a filling material packed in towers, and passing a mixture of acetaldehyde and oxygen or air through the mass. The addition of a suitable catalyst, such as vanadium pentoxide, uranium oxide, roasted ferrose-ferric oxide, etc., greatly accelerates the reaction.

Additional Patents

British Patent No. 8,076, April 3, 1912; and United States Patent No. 1,081,959, to G. W. Johnson and N. Grunstein, respectively, assignors to the Chemische Fabrik Griesheim-Elektron, cover a modification of the procedure of British Patent, No. 17,424 of 1911. It specifies that a small quantity of the acetaldehyde is first oxidized as completely as possible, by means of an excess of oxygen, instead of using acetic acid or one of its chlorine derivatives to start the reaction. After this preliminary oxidation, more acetaldehyde is added and a larger stream of oxygen is admitted to oxidize the fresh aldehyde.

Canadian Patent No. 14,330, October 15, 1912, to N. Grunstein, provides that in the conversion of acetaldehyde to acetic acid, a large amount of acetic acid is first placed in a container provided with a stirrer and a small amount of acetaldehyde added to this. Oxygen or air rich in oxygen is passed through this mixture, accompanied by vigorous stirring.

French Patent No. 473,158, June 8, 1914; and British Patent No. 14,113, June 11, 1914, to the Chemische Fabrik Griesheim-Elektron, cover a single step process for the synthesis of acetic acid from acetylene. The acetylene and oxygen are introduced alternately in small quantities into an acetic or other acid solution containing a mercury catalyst. The acetate, sulfate and phosphate of mercury are suggested as catalysts and the organic acid used should be easily separated from the acetic acid formed. Chloroacetic and lactic acids are mentioned. In addition to the mercury compounds, contact substances such as iron oxides or vanadium pentoxide, and accelerating agents such as phosphoric acid, sulfuric acid, or bisulfates, may be used.

Swiss Patent No. 70,152, September 1, 1915, to the Chemische Fabrik Griesheim-Elektron, probably covers the same process and specifies the reaction of acetylene, oxygen and water in a solution of a water-soluble fatty acid containing mercury compounds.

Further Patents Using Mercury

United States Patent No. 1,174,250, March 7, 1916, to N. Grunstein, also covers the reaction of acetylene, water and oxygen to produce acetic acid. It specifies a temperature of 70 to 90° C. in a solution of acetic acid, phosphoric acid, and mercuric oxide or other mercury salt. The acetylene and oxygen are alternately introduced. The yield of 95 per cent acetic acid is claimed to be 90 per cent or more of the theoretical.

Dutch Patent No. 3,679, September 5, 1919, to the Chemische Fabrik Griesheim-Elektron covers that reaction of acetylene, water, and oxygen, in a solution of acetic acid, or a chlorine derivative, and in the presence of mercury compounds.

British Patent No. 143,891, May 27, 1920, to the Chemische Fabrik Griesheim-Elektron provides for the continuous regeneration of the mercury catalyst used in the above patents. This regeneration is effected in the absorption vessel by an anodic oxidation process, in which the reduced mercury forms the anode, the acid reaction liquid the electrolyte, and mercury, lead, or platinum, the cathode. The cathode may either be arranged in a chamber closed by a diaphragm from which the hydrogen is discharged, or it may be placed in the acid reaction liquid without using a diaphragm. The hydrogen, which gradually accumulates in the circulating gas, is removed at intervals. It is claimed that by the use of this process larger quantities of mercury salt, exceeding 10 per cent of the weight of the acid reaction liquid, can be employed, with a consequent increase in the rate of absorption of the acetylene.

German Patent No. 365,588, March 4, 1917, to the Chemische Fabrik Griesheim-Elektron and N. Grun-

stein specifies that the above regeneration, described in the previous patent, may be accomplished by an alternating current if two mercury electrodes are used.

The Elektrochemische Industrie Patents

German Patent No. 274,032, November 19, 1911, to the Consortium fur elektrochemische Industrie, covers the manufacture of highly concentrated acetic acid by the electrolytic oxidation of acetaldehyde and its polymers. Solutions containing two per cent of acetaldehyde are subjected to electrolysis without the use of diaphragms. The electrolysis is continued, with the continuous addition of aldehyde, until the desired high concentration of acetic acid, and a low aldehyde concentration, are obtained.

British Patent No. 16,849, July 22, 1913, to the same company, provides for the preliminary oxidation of acetaldehyde to a per-acid. The aldehyde is treated with oxygen, or oxygen-containing gases, at a low temperature, preferably with the exclusion of injurious impurities, such as water and manganese compounds. When the peracetic acid formed is allowed to warm up to room temperature, the remaining acetaldehyde decomposes it into acetic acid. The per-acid reaction is catalyzed by means of chemically active light rays.

Use of Manganese Compounds

French Patent No. 460,971, July 25, 1913; and British Patent No. 17,016, July 24, 1913, to the Consortium fur elektrochemische Industrie specify that the conversion of acetaldehyde into acetic acid by oxygen is accelerated by the addition of small quantities of manganese compounds. This reaction is not explosive, as is the case when compounds of chromium, vanadium, cerium, etc., are used as accelerators. In an example, two kilograms of manganese acetate are added to 300 kilograms of pure acetaldehyde in a pure aluminum vessel, provided with a stirrer and a cooling jacket. A current of dry oxygen is passed into this mixture. The acetate dissolves in the aldehyde and the solution absorbs a large volume of oxygen, the heat liberated being removed by external cooling. The absorption is complete in 10 to 20 hours and the acid may be removed by distillation. Air may be substituted for oxygen, and the gases may be introduced under pressure. It is also stated that acetic acid or some other solvent may be added to the aldehyde, if desirable.

British Patent No. 7,418, March 24, 1914, and Austrian Patent No. 71,348, March 10, 1916, to the same company cover the oxidation of acetaldehyde by air or oxygen in the presence of a catalyst consisting of manganese formate, acetate, butyrate, benzoate, or lactate, or the manganese salts of similar organic acids.

British Patent No. 467,515, January 20, 1914, to the Farbenfabriken vorm. F. Bayer & Company, and United States Patent No. 1,128,780, February 16, 1915, to C. Hansen and A. Weindel; assignors to the Synthetic Patents Company, cover the conversion of acetylene to acetic acid by passing it through a solution of hydrogen peroxide, persulfuric acid, monopersulfuric acid, or a salt of one of these acids, in the presence of mercury or a mercury compound. In an example, 10.8 parts by weight of acetylene are passed into a mixture of 250 parts of 20 to 30 per cent sulfuric acid, 100 parts of 95 per cent ammonium persulfate, and 5 to 10 parts of mercuric oxide, at a temperature of 30 to 40° C. The resulting liquid is stated to contain 24 to 25 parts of acetic acid.

French Patent No. 467,778, January 27, 1914; German Patent No. 293,011, March 28, 1913, to F. Bayer and Company; and United States Patent No. 1,159,376, November 9, 1915, to C. Hansen and A. Weindel, assignors to the Synthetic Patents Company, cover the anodic oxidation of acetylene to acetic acid. A solution of sulfuric or other acid solution is used as the electrolyte, in the presence of a mercury compound. An example is given in which the anode compartment of an electrolytic cell, with a clay diaphragm and lead anode, is filled with 30 per cent sulfuric acid containing 1 to 2 per cent of mercuric oxide. The lead or copper cathode is also filled with 30 per cent sulfuric acid. Acetylene is introduced into the anode compartment at the rate of 48.5 grams per 100 ampere hours. The current specified is 5 to 15 amperes per square decimeter of anode surface at 3 to 4.5 volts, and the electrolyte is held at 30 to 40° C. The yield of acetic acid amounts to 0.5 kilogram or more, per liter of anolyte, in 24 hours.

German Patent No. 299,782, January 27, 1916, to F. Bayer & Company covers the oxidation of acetaldehyde to acetic acid by treatment with air or oxygen in the presence of kisselguhr.

German Patent No. 305,182, March 5, 1916, to the same company, specifies the continuous or intermittent passage of oxygen or air through the reacting liquid containing sulfuric acid and mercury compounds, so that at least one equivalent of sulfuric acid reacts with one equivalent of mercury sulfate. In this way reduction of the mercury salt is avoided.

The Badische Patents

German Patent No. 294,724, February 11, 1914, to the Badische-Anilin & Soda-Fabrik covers the oxidation of acetaldehyde by air or oxygen in the presence of iron compounds and organic salts of alkalies or alkaline earths, including magnesium and aluminum. The reaction is accelerated without the formation of per-acids. It is stated that the reaction proceeds rapidly to completion without heating.

German Patent No. 296,282, of 1917, an addition to the previous patent and granted to the same com-

pany, provides for the use of substances such as nickel acetate or animal charcoal as catalysts, instead of iron compounds.

The Meister, Lucius and Bruning Patents

British Patent No. 10,377, April 27, 1914; French Patent No. 471,255, April 22, 1914; and German Patent No. 286,400, April 27, 1913, to the Farbwerke vorm. Meister, Lucius & Bruning cover the oxidation of acetaldehyde in the presence of about one per cent of its weight of a catalyst, preferably ceric oxide. This mixture is treated with oxygen under a pressure of about two atmospheres, or with air at a somewhat higher pressure, for five hours. The reaction is exothermic and external cooling is provided to keep the temperature under 60° C. It is claimed that 95 per cent of the theoretical amount of glacial acetic acid is produced by this method.

Norwegian Patent No. 26,693, February 21, 1916, to the Farbwerke vorm. Meister, Lucius & Bruning covers the oxidation of acetaldehyde to acetic acid by the aid of oxidizing agents under pressure. Cerium oxide, copper acetate, and manganese acetate, are specified as catalysts.

Norwegian Patent No. 26,694, February 21, 1916, an addition to the preceding patent, covers a modification of the previously described method. According to this process, the oxidation is effected in the presence of a pair of catalysts which are made of different metals, or the oxides or salts of different metals, with or without the application of pressure.

The I. G. Farbenindustrie A.-G. Patents

British Patent No. 304,855, November 2, 1927, to J. Y. Johnson, assignor to the I. G. Farbenindustrie Akt-Ges., covers the preparation of acetic acid by passing acetylene, mixed with hydrogen and oxidizing gases such as air, the latter being added in stages, over a catalyst having both oxidizing and hydrating properties. In the two step preparation of acetic by way of acetaldehyde, salts of mercury or vanadium, such as mercuric phosphate at 120° C., are used. For one step conversion to acetic acid, salts, particularly the vanadates, of tin, silver, or mercury, at 200 to 250° C. are specified.

French Patent No. 645,967, December 1, 1927, to the I. G. Farbenindustrie Akt-Ges., covers the preparation of acetaldehyde or acetic acid from acetylene. The acetylene is passed over a contact substance, such as salts of mercury, silver, tin, or copper, but preferably containing vanadium in the acid radical, in the presence of hydrogen and an oxidizing gas or a substance liberating oxygen. In an example, a gaseous mixture, containing a high percentage of acetaldehyde is formed by passing hydrogen, nitrogen, acetylene, and oxygen over mercuric phosphate at 110° C. It is claimed that a gas containing 30 to 35 per cent of acetic acid is obtained by passing hydrogen, acetylene, and oxygen over silver vanadates at 250° C. Tin vanadate may also be used.

British Patent No. 319,542, December 3, 1928, to the same company provides for the hydration of acetylene in the presence of a solution of mercuric and ammonium salts, such as the solution formed from 500 parts of ammonium sulfate, 10 parts of mercuric oxide, and 183 parts of 96 per cent sulfuric acid, per 1,000 parts of water. It is claimed that the presence of the ammonium salts prevents the formation of sludge and prolongs the activity of the catalyst.

British Patent No. 321,241, August 9, 1928, to the I. G. covers the conversion of acetylene into acetaldehyde or acetic acid by passing acetylene, or gases containing it, mixed with water vapor, over catalysts consisting of non-volatile mercury compounds, such as mercury phosphate, vanadate or sulfate. Carriers may also be present, as well as heavy metal compounds, such as the vanadates or oxides of zinc, iron, manganese or cerium, the vanadates of silver or tin, or the oxides of tungsten or vanadium.

British Patent No. 329,867, June 12, 1929, to J. Y. Johnson, assignor to the I. G. Farbenindustrie Akt.-Ges., covers the manufacture of acetaldehyde from acetylene by passing a mixture of acetylene and steam at 300 to 400° C., over a tungsten catalyst. A suitable tungsten catalyst may be prepared by treating clay with silicotungstic acid, or by igniting ammonium tungstate on clay or zinc oxide.

(This series will be continued in the August issue.)

Bookshelf

The Potash Industry, by George Ward Stocking, 339 pages, published by Richard R. Smith, Inc., N. Y., ($3.00).

A study of the economic characteristics of the potash industry, and a consideration of the need of state control, with conclusion on Germany's experiment in state control set forth.

"Chemische und Physikalische Technologie der Kunstseiden". (Chemical and Physical Techonology of Rayons). By Dr. W. Weltzien, assisted by Dr. K. Götze. Published by Akademische Verlagsgesellschaft m.b.H. With 261 illustrations and 44 tables, clothbound. Price RM 45.—($10.75).

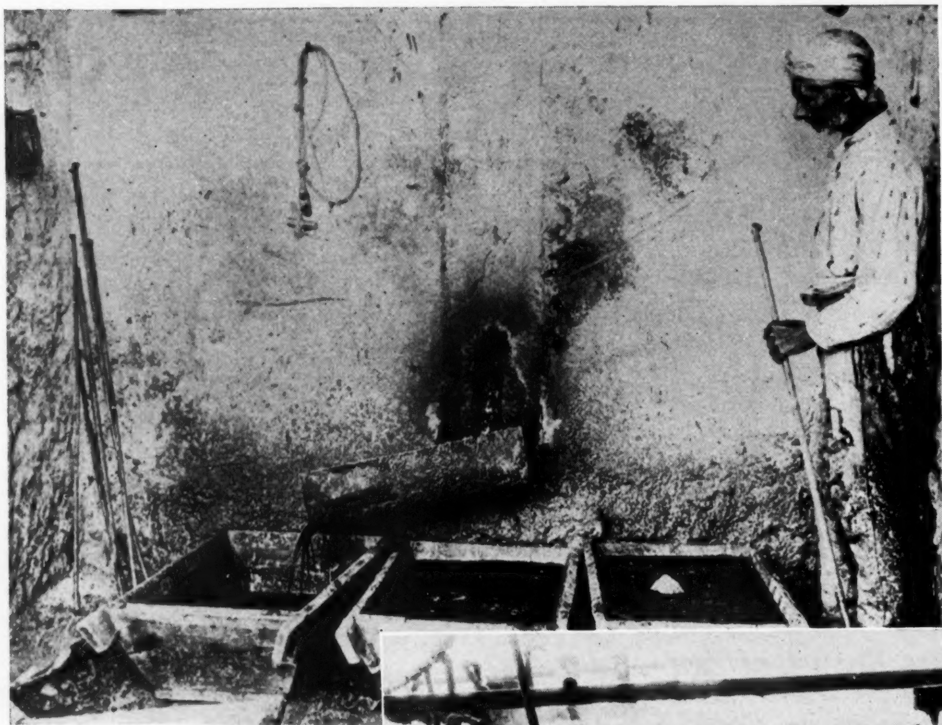
This comprehensive work by the Director of the Textilforschungsanstalt in Krefeld is, doubtless, one of the best books available on the chemical and physical technology of rayons. His own investigations and research work make the author especially fitted to write on the chemistry, physics, and colloidal chemistry of fibers, as well as on the problems which arise in their dyeing.

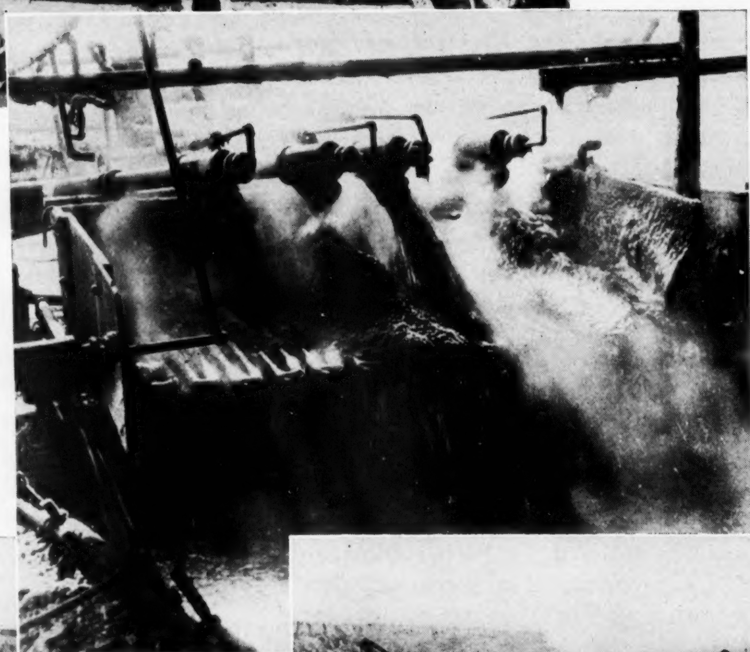
Industrial Microbiology. By Henry Field Smith and Walter Lord Obold. Published by The Williams & Wilkins Co., Baltimore, Md. Price $6.00.

This book was published "in recognition of the growing importance of microbiological processes in industry." This is quite appropriate, for the application of microbiological processes is gaining more and more importance in many industries. The wide range of topics opens a surprising field for development and possible application. Of course it cannot be expected to get many details about this immense field on 313 pages, but the purpose of the book is merely to guide the beginner to the present literature, and to help him on his way in his investigation.

Sulfur Mining in Sicily

Primitive methods of refining continue to handicap the Sicilian industry in competing in the World markets





Above, sulfur found in Sicily is combined with some other substance, in the majority of cases, limestone—so that it must be melted and separated. Photograph shows a kiln fired by charcoal with the molten sulfur being tapped. Below, left, separating the sulfur from the limestone after mining. Lower right, general view of the rude kilns and refuse heaps of limestone

A new refining method—showing the sulfur running off after proper heating. Such improvements in equipment have aided in reducing production costs

Plant Management

A Department
Devoted to the Business Problems of Chemical-Process Production

Whose Responsibility

RESEARCH and operating officials have no cause to complain now of lack of cooperation from their colleagues in the front office. Executive interest has shifted a large part of its attention to the production and development divisions. The sales manager is as vitally interested in lower costs as he is supremely indifferent to how this result is obtained. The treasurer is keenly concerned to the smallest fraction of a cent—he always has and always will be—for today the most important job he has is watching costs. The administrative executives are well aware now of a new economic situation that promises very definitely to control commercial supremacy in the next decade—the question of lower production costs. On the other hand, present conditions demolish the former easy-going ideas of lowering costs by increasing output. Where then shall technical and operating executives turn to obtain the necessary results ?

THE most pressing duty at the moment for the research division is further investigation of the possibilities of additional refinements of present processes and the substitution of cheaper but equally satisfactory raw materials. The search for new products while always important and timely is not now as vital as work pointing to reduction of costs. New products from present waste material are properly considered in the light of worthwhile savings.

OPERATING officials should check closely present equipment, substituting where advisable worn or obsolete equipment with new. The chemical industry as a whole has been less tolerant of poor tools than any other that can be mentioned and to this fact we may rightfully attribute a great deal of the spectacular advances made in the past ten years. Nevertheless, now is the time to take inventory when, if new equipment or plant additions are needed, they can be obtained at lower prices than have prevailed for several years back. The fields of automatic control and mechanical conveying and handling are but examples of where possible golden nuggets may be found.

AFTER several years of being in the wings, while the sales department courted the spotlight, the research and operating divisions are "distinctly downstage." Executives in charge of these divisions will find considerable food for thought in Dr. H. W. Elley's splendid article, "Training du Pont Chemists" appearing in this issue. Those companies with definite research and control programs are writing the very best kind of insurance for the future.

THE new attention however, brings its responsibilities. Plant in its approach to the front office must be thoroughly posted. The president, treasurer, sales manager and those down the line are open to suggestions that really mean savings. Look around! Look ahead!

Fire Prevention In Chemical Plants

By C. W. Johnson*

CHEMICAL plants have given the fire insurance interests more concern and as a result, have received more careful study and analysis than almost any industry, particularly since the World War. Prior to that time the average fire insurance underwriter thought of chemical plants in two classes—heavy and light; analysed as the names imply. But immediately after the war this entire situation changed, for plant after plant manufacturing chemicals (in buildings not properly designed in the first place) attempted operations on new products, without making safety improvements, or even without proper laboratory tests on a manufacturing basis, passed out of existence with serious fires and in most instances heavy losses to the insurance companies.

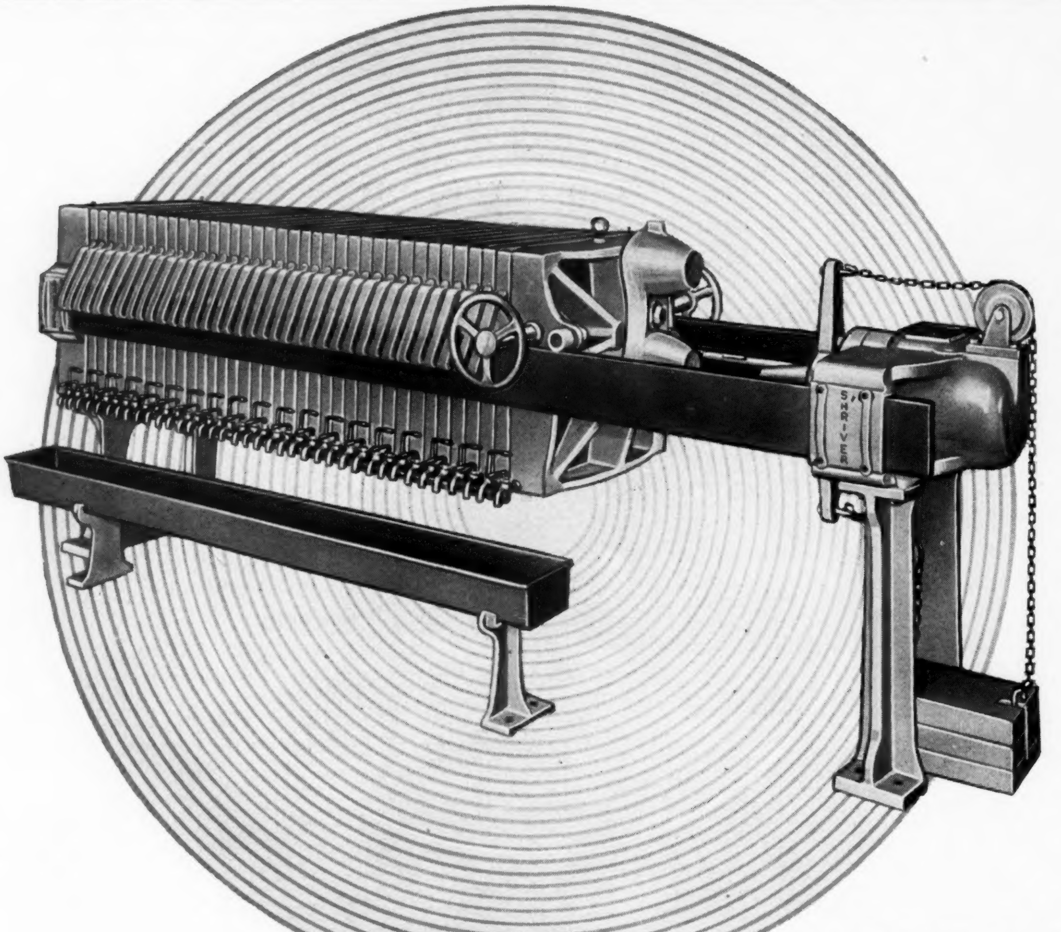
Today, however, with the continued cooperation of the chemical industry, the better types of construction, better methods of handling operations, improved electrical grounding, better forms of ventilation, it is safe to say that these plants can be as safely protected and arranged from serious fire and explosion as most other industries, in spite of the inherent hazards which are bound to be present on account of the nature of the product.

The National Board of Fire Underwriters and the Underwriters' Laboratories are continually preparing and publishing articles on the safe handling and storage of chemicals of a volatile nature, the proper designing of buildings, and the handling of chemicals of an explosive nature. The National Safety Council has recommendations and literature on safeguarding against accidents from fire and explosions, and on health features. The automatic sprinkler and the fire extinguisher manufacturing concerns are co-operating in devising new systems of automatic protection with water, foamite and CO-^{2} gas, so that it is possible to design buildings and arrange manufacturing processes that are reasonably safe from destruction by fire or explosion, as well as lightning. In preparing plans for new buildings, re-arranging and developing new processes, using new materials that are known to be of volatile or hazardous nature, always seek advice from insurance interests as to the proper design and arrangement of buildings, safeguarding operation and use of materials and machinery, thus eliminating at the start any possibility of a serious accident or fire or doing something that might reflect later on in an added cost, spread over your entire insurance project.

Economically, the proper design and protection of a chemical plant has been previously expressed from

*Assistant Secretary, Insurance Co. of North America

C. W. Johnson, in charge of engineering and fire prevention work for the Insurance Co. of North America was the originator of the "White Fireman" idea of fire prevention. It would be difficult to estimate the savings effected in reducing fire insurance rates by eliminating dangerous hazards. By means of personal cooperation and well planned educational advertising, his original modest idea has grown to one of national significance and importance.



One of the 5 hydraulically closed Shriver Filter Presses recently installed in a new yeast plant.

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Far sighted manufacturers know from actual experience that the selection of a filter press is as important as the processing of their product.

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the standpoint of interruption of continued production. Further, it has been known where serious fires have destroyed important records and formulas that could hardly be duplicated; to say nothing of the loss of trade which has easily diverted to other concerns. Again it is reflected in a very low rate of insurance. After all it is the owners of the plant who really make their own fire insurance rate. The schedule used by underwriters' generally, is nothing more than a measuring stick which adds to for deficiencies and takes away or reduces the final cost by credits for standard construction, standard arrangements of manufacturing processes and standard protection.

An analysis of some of the important fire prevention features of chemical plants might well be emphasized here and divided into the following headings:

Location

Chemical plants, generally, on account of the nature of their product or for railroad facilities have to be located some distance from the main section of a town. This is no detriment, if the site is carefully selected, both from a possible condition of high-water trouble or in case of storage or handling of volatile chemicals the ground slope is such that it can be controlled from spreading fire conditions. Locating outside, the hazards from closely adjoining exposures are eliminated, or easily protected against, but it is very essential that good water supply of ample capacity and pressure be available.

Construction

Fire resistive construction of some type is probably best adapted for the general run of chemical plants. On the other hand, there are sections that would be subject to severe corrosive conditions which might make it better to construct the floors and roof of wood, in which case heavy timber construction would be normally recommended, as it is more easily protected with automatic sprinklers in addition to the advantage of the slow burning qualities. In case of a new plant this, of course, can be worked out much more easily and in these days with probably a closer comparison of costs. Frame walls should be eliminated wherever possible on account of communication, plus the advantage of frequent fire divisions in the average chemical plant to segregate hazards in as small units as possible without unnecessary interruption to the manufacturing processes.

Temporary Buildings

Too many of the chemical plants have the habit of putting up small, temporary buildings which are designated for experimental purposes, but soon become permanent buildings and house important operations as well as important values. Very often this means a heavy penalty in the fire insurance rate, as well as a serious exposure to other important manufacturing units. A program should be outlined for construction and location of hazards to carry through in case of any change in operations or new processes for new market demand, planned out with your insurance interests.

Light and power, heat and ventilation: This is important in connection with arranging construction and processes.

1. Light and Power. Electrical installation for power and light is particularly of importance and should be standard in every respect as indicated by the National Code, which covers these features thoroughly. Machines for coating, mixing and grinding processes should have proper electrical grounds and there are now devices in the market which take care of these features very thoroughly.
2. Heat. The heating can be one of several systems, such as hot air, hot water, steam, but the heating units such as boilers, either coal-fired or oil-fired, should be properly isolated.
3. Ventilation. Where natural ventilation is possible it is always the best. Where forced ventilation is necessary it should be studied very carefully, as many fumes are better handled under a suction form of ventilation rather than forced ventilation.

It is important that the boiler house, machine and repair buildings, where live fires are liable to be used, are well separated from processes where there is liability of volatile gases or liquids escaping.

Manufacturing Processes

In designing the construction and location of various buildings—this should be on the basis of the manufacturing processes, and if the materials used are particularly hazardous in that they throw off volatile vapors or are very inflammable in themselves, or in contact with other materials, it is well to isolate these in as small units as possible, bearing in mind proper ventilation, protection from sparks, live fire and so forth. Openings to rooms should be properly protected with fire doors, automatically operated by fusible links or quick-heat actuating devices.

Floors should be properly drained to eliminate any inflammable materials that might get out on the floor spreading to adjoining section.

Storage of raw materials and finished materials is particularly important in the arrangement of processes, and this is always essential, especially so if they are susceptible to heavy water damage or action one from the other. Chemicals handled in liquid form that can be pumped should be so handled, wherever possible,

to eliminate any open handling, and should be so stored that an accident or leakage would not have a serious effect. Finished goods that cannot be stored in tanks or drums should be protected off the floor and stored in sections where there are no unusually hazardous processes involved.

The I. C. C. "Regulations for the Transportation of Explosives and other Dangerous Articles" have carefully developed various colored labels for acceptable articles. Red, yellow, white and green, but very often when these labelled materials are received at the chemical plants very little attention is paid to the warning labels while being handled and stored.

If railroad sidings come into the property (and this is usually the case) bringing in tank cars of volatile liquids for unloading, special attention should be given to where this work is done and how handled. A very serious fire occurred at a plant unloading gasoline, when extra cars were released, bumping the car unloading and breaking off the discharge connections; sparks from the grinding brakes quickly ignited the leaking gasoline, which had spread along the tracks to a nearby loading-platform filled with finished materials ready for shipment, causing a very serious loss in a very well constructed and protected plant.

If quantities of volatile liquids are stored, isolate in outside tank storage section, with reinforced concrete walls or earth dikes surrounding; if necessary to enclose on account of temperature conditions, proper protection can be arranged, supplemented with proper fire protection equipment.

Protection

This problem is pretty hard to make general. A good source of water supply of considerable volume and good working pressure should always be available. Automatic sprinklers can be safely installed in most of the plants, but there may be some sections where water discharged would create trouble, in which case protection might be developed with a system of piped CO_2 gas; and under some conditions foamite, would be satisfactory. Ample supply of yard hydrants with proper mill hose should be available to protect a sudden spread of fire, and a carefully drilled fire brigade among the plant employees is normally very essential.

Many plants have city fire department protection. If they respond to an alarm, it is very essential that the fire department heads be thoroughly instructed beforehand as to the hazards and processes in the various buildings, so that the proper thing will be done at the proper time. This is particularly essential for night fires, when the normal corps of experienced department heads would not be available. This protection should be reinforced by plenty of so-called first aid protection in the way of hand chemical extinguishers of the soda acid or foamite type; carbon tetrachloride, and liquid carbon dioxide extinguishers for electrical and small chemical fires. Sand pails might also be valuable, these being arranged according to the individual conditions. Very often if a fire can be caught immediately it starts it will eliminate the use of large hose streams or even the automatic sprinkler system with more or less heavy water damage.

Care and Maintenance

This is very essential in a chemical plant and a careful, systematic removal of all waste materials is an absolute necessity. This not only eliminates the possibility of small fires starting, but has a good moral effect upon the employees in keeping cleaner surroundings, which is one of the best fire prevention recommendations that can be made. To encourage a higher standard of care and cleanliness in a plant the writer once inspected, one of the questions on the weekly inspection tour sheet used by the Plant Engineer was "Which is the dirtiest room ?" You can imagine it wasn't long before the Plant Engineer had a hard time guessing the answer.

Buildings and all operating equipment should be maintained in good condition at all times, and a careful systematic inspection made of all fire protection apparatus, as well as equipment designed to eliminate fires, such as groundings of machines, electrical equipment, fire doors, ventilating equipment and so forth.

Many fires have been caused in chemical plants by doing things at the wrong time or in the wrong way. Too much emphasizing cannot be made on the importance of competent supervising men in charge of various operations to see that they are familiar at least with the flash point, explosive range, and vapor density of the compounds used if of a volatile nature.

A superintendent accompanying an insurance inspector through his plant having previously indicated how well his men were trained, and anxious to prove to the Inspector, suddenly stopped one of his employees, who happened to be of Irish descent, and said "Mike, what would you do if fire suddenly broke out in your department ?" Mike quickly replied, "Be Gorre, I would grab my coat and run like Hell!"

The plant should be thoroughly enclosed in a tight fencing so that access can only be had through the office or gate tender's entrance, to eliminate strangers coming into the plant. Watchman service of the right type is very essential and if the plant is of any size, more than one man should be maintained at night and Sundays. If any processes are carried on at night they should be under competent supervision at all times and watchman should know general instructions and be required to go through a drill sufficient to make sure that he would handle an emergency matter as anticipated.

"No Smoking" signs, instruction cards and occasional meetings are very desirable, both from a safety standpoint as well as fire prevention.

Having been a fire insurance inspector the writer would like to make a plea for a better understanding and fuller sympathy with the outside Inspector. You as Plant Managers, Superintendents or Engineers are busy with production and operation; big things are quickly detected, but the little things get by and it is these little things that often cause the most trouble and normally are noted and pointed out by outside inspector.

If you plan changes talk them over with him; if experimental work or some secret operation is under way and the room is locked and marked "No Admittance" tell him if there are any volatile chemicals used there, any open-flame furnaces, or explosive possibilities; he does not need to know the details—only fire protection essentials; but don't try to coax him by the place because he will naturally be suspicious and he may go away with the wrong impression entirely. Be with him as much as you can, and get all the minor complaints cleared up before he leaves.

Chemical Construction

Announcement was made recently in Portland, Oregon, by Willis E. Straight that he represented Eastern interests arranging for a site for a new tannic acid plant, the first unit of which is to cost $150,000.

The du Pont Cellophane Co. has plans for expansion on its Buffalo Plant, representing an outlay of approximately $2,000,000.

Hercules Powder Co , announces that its plant at Bessemer, Ala., destroyed recently by fire will be rebuilt shortly.

The Holston River Power Co., (American Cyanamid) has made application before the State Corporation Commission of Virginia asking permission to overflow the lands along the south fork of the Holston River in Washington County, Virginia.

Merrimac Chemical Co., Everett, Mass. has made plans for an addition to its aluminum sulfate plant.

Naugatuck Chemical Co., (U. S. Rubber Co.) has announced rebuilding of that part of its plant recently destroyed by explosion.

Sylvania Industrial Corp., Fredericksburg, Va., has awarded a contract to the Hughes Foulkrod Co. of Philadelphia for the construction of a new addition to cost about $1,000,000.

New Incorporations

New Jersey Charters

Commercial Prod. Inc., Hasbrouck Heights, Mfg., drugs, chemicals—William K. Voehringer, Hasbrouck Heights, $25,000 pf, 500 shs. com.

Henkhorn, Inc., Newark mfrs., drugs, chemicals—L. F. Feinseth, Newark, $50.000.

The U. S. Lacquer Corp., Newark mfrs., paints and varnishes—Solomon Golatzky Newk, 2,000 shs. com.

Vapon Inc., Montclair mfr., drugs and chemicals—U. S. Corp. Co. New York City, 2,000 shs. com.

Delaware Charters

The America Pharmaceutical Corp., Wilmington, Del. Chemical Prod.—Corporation Service Co., $200,000, 20,000 shs. com.

Lambert Chemical Co., Inc., Philadelphia, Pa., chemicals—Corp. Guarantee & Trust Co., $500,000.

Equipment Bulletins

Plant Managers, plant engineers, consultants, those in charge of operations, and purchasing agents will find in this column valuable suggestions in the way of new booklets bearing on equipment, etc.

The Plant Management Department of Chemical Markets will be glad to forward requests for the above booklets to the proper channels for attention should this be preferred.

Swenson Evaporator Co., Harvey, Ill., has just completed a very complete survey on the subject of evaporation. Profusely illustrated and containing a wealth of engineering data this 44 page booklet should prove very valuable to the designing and operating officials in the industrial chemical and allied fields. The booklet is numbered E-131 and supersedes No. E-127.

The Griscom-Russell Co., 285 Madison Ave., N. Y. City, has just issued folder 479 on "Heat Transfer Equipment for the Chemical Industry."

The U. S. Stoneware Co., 50 Church St., N. Y. City is now distributing Bulletin 402, describing its line of jars, tanks, stills, and mixers.

Palmer-Bee Co., Detroit, Mich., has announced that a new catalog No. 53 is now ready for distribution. The booklet consisting of 64 pages is very comprehensive and is profusely illustrated besides containing valuable engineering data.

The Patterson Foundry & Machine Co., East Liverpool, Ohio, is now sending out Catalog No. 312 describing its line of Patterson Pebble Mills. This booklet should be of interest to those working on grinding and pulverizing problems.

The Cooling Tower Co., Inc., 15 John St., New York City, has released Bulletin 303, "Atmospheric Cooling Towers" and also data sheet No. 330. The many types and sizes are completely described.

Raymond Bros. Impact Pulverizer Co., 1302 N. Branch St., Chicago, Ill., has issued a four page leaflet giving details of the Super Roller Mill, the Midget Roller Mill and the high side Roller Mill.

Central Scientific Co., 79 Amherst St., Cambridge, Mass., has just announced that it is renewing its former program of systematic mailings of technical information on the complete line of laboratory ware and equipment it manufactures and distributes. Those desiring to be placed on the mailing list may do so by writing the company.

Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill., has just issued a new book No. 1217, on handling and rehandling Fuller's Earth at the oil refinery.

The Cooper Alloy Foundry Co., 150 Broadway, Elizabeth, N. J. has just issued a new handy pocket size reference chart of Sweetaloy castings for all corrosion and heat resisting purposes. This is complete with analyses, physical properties and uses recommended together with other important data of interest to the engineer.

U. S. Bottlers Machinery Co., 4015 N. Rockwell St., Chicago, Ill., has completed a very attractive booklet describing its washing and drying equipment.

General Ceramics Co., 71 W 35th St., N. Y. City has just released a new folder describing "Ceramit" a new ceramic material of great density and also a new type of acid-proof brick.

Hydrogen Cyanide Is Flammable

The article "Safety in Handling Compressed Gases" by Robert Hugh Ferguson, safety engineer for the National Safety Council, which appeared in the May issue contained a misstatement in the table on page 511. Hydrogen Cyanide in the liquid state was reported as being non-inflammable whereas it should have read flammable. In the concentrations usually employed in fumigating it is considered non-inflammable.

Training du Pont Chemists

First presented before the graduating students of our leading technical colleges assembled at the Chemical Exposition, Dr. Elley's paper is of interest to executives in charge of personnel and the training of technical men.

By Dr. H. W. Elley*

PROPERLY chosen men, when they come to us, have very good grounding in the fundamentals of chemistry and also have those personal characteristics which should enable them to work efficiently and harmoniously with their fellow chemists and those directing the work. The necessity of intimate familiarity with the basic fundamental facts of chemisistry cannot be over emphasized. This basic information is the foundation material of chemical building and how can progress be made if the specifications of the building materials are unknown. The task confronting the employer, therefore, is to so guide the newcomer's activities that in the shortest possible time he will become familiar with the detailed subject matter, and with the objectives of the organization, and be able to carry on independent work efficiently.

In general, two types of chemists come to us. The first is represented by the four and five year men and the second by those who have pursued their post-graduate studies for several years and have received their doctor's degree. There has been much discussion in regard to the necessity for Ph.D. training in order that a chemist might be eligible for the greatest advancement. Experience shows that it is not essential but that it helps greatly—particularly from the standpoint of speed of advancement. In most companies the Ph.D. is placed in research work immediately and he starts out at a salary substantially higher than the four year man. Moreover, there seems to be a more or less subconscious tendency to advance the Ph.D. more rapidly to positions of greater responsibility. However, it should be pointed out that some of our most productive, capable, and important men do not have advanced degrees, and this proves that the higher degree is not a prerequisite to advancement and that in the final analysis, it depends on the man. In *either* case, it is necessary to give them additional training to enable them to carry on research work in the laboratory or to participate in the manufacturing operations.

If you wish to take the Dyestuffs Department of the DuPont Company as an example of the methods employed in training chemists, I can tell you what the conditions are and what happens to a newly arrived chemist. All our new chemists are originally located in the research laboratory and gain their first experience in this section of the Department. The research laboratory is composed of a group of seven Divisions each having from 10 to 30 chemists and corresponding to the natural classifications of the work being carried on. Each Division is directed by an experienced chemist of considerable maturity and background. In fact any of the Division Heads would be qualified to carry on independently and because of the size of their staff and the diversity and complexity of the work they direct, their Divisions are really comparable to an independent research laboratory.

In one of the research divisions there is placed the central analytical laboratory of the Department. The analytical laboratory has various lines of activity, one dealing with the analysis of raw materials, from which official specifications are set up; another with the analysis of control samples from the manufacturing process as a check on similar analyses carried out by the plant laboratories; another analyzes samples which are the result of research investigations while still another is concerned with the development of new and more accurate methods of analysis. It is evident, therefore, that in this section it is possible to get a cross section of the entire activities of the Department. Because the four and five year chemist

*Director, Chemical Section, E. I. du Pont de Nemours & Co.

has had little or no experience in conducting research investigations and would consequently be under a considerable handicap in that type of work, it has been found very advantageous to him to be placed in the analytical section when he is starting out. He already knows something of the technique required and he has an opportunity to add to his fund of knowledge in a normal manner. As soon as he has mastered one determination he is given a new one. He is urged to inquire into the source of the sample he analyzes; and to get a description of the process from which it came; to study the technical literature pertaining to the subject; to discuss it with the chemist submitting the sample and thus gradually to become versed in the art.

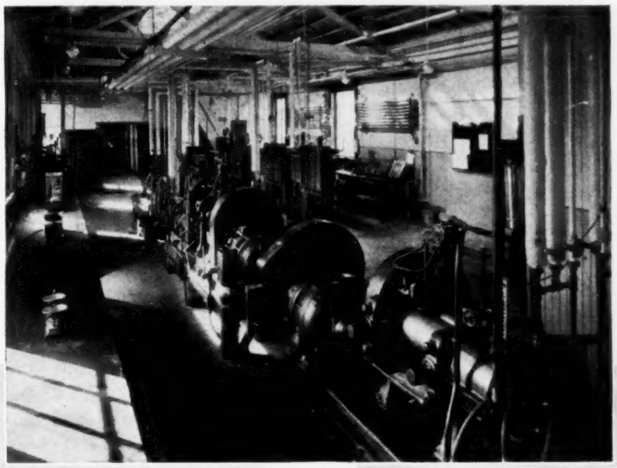
In order that the new chemist may see a little farther than the horizon of the analytical laboratory he is taken on scheduled visits to the various manufacturing areas and under the guidance of the plant supervisor or superintendent the operations being carried on are explained to him in as much detail as he would be expected to appreciate. In this way he obtains a concrete idea of what is going on and is able to see an application of some of his laboratory experience in terms of tons of material and to get an ultimate visualization of the profits on which industrial companies are established. His work becomes more real to him and he attacks the daily task with increased enthusiasm.

As his experience grows, he is given problems which tie indirectly and intimately with research problems or manufacturing operations. If the purity of a product is low, he is asked to identify and estimate the nature and amount of the impurities present in order that an idea may be gained of the side reactions which are going on. An appreciation of this sort and a knowledge of the conditions under which these compounds could be formed will many times suggest a modification of procedure which will result in substantial increases in yield of the desired product. The application of analytical methods and technique to synthetic reactions frequently results in improvement in synthetic work.

Another most important phase of the analyst's work is in the development of control methods by the use of which the progress of a reaction can be followed or the purity of the final product can be accurately determined. The working out of such methods requires absolute familiarity with the chemistry involved in the particular synthesis under consideration as well as a broad knowledge of chemistry in general so that reactions may be employed which will be effective in solving the immediate problem. I venture to say that a chemist who is required to work out a wide variety of control methods must know more chemistry than many chemists whose duty it is to synthesize new compounds in a highly specialized field. And it should be pointed out that without adequate chemical control, and this means accurate analytical methods, progress is bound to be slow and very uncertain.

During this period the chemist has an opportunity to find himself and to form a better idea of whether or not the industrial environment really appeals to him.

Research has played a vital part in the expansion of the original du Pont Company from a powder producer to the multitudinous activities it now embraces



The research laboratories of the du Pont Company are well equipped and housed in comfortable quarters

He is thrown into contact with many people who have been in industry for many years and whose opinion is to be valued. He can see in the accomplishment and position of others what is potentially ahead of him. It will be a test of his patience and also his faith in himself and this is an essential part of his training.

On the other hand, those in charge of the work have an opportunity to size him up and to determine what sort of a person he is and what his capabilities seem to be. It will be determined to what degree he has the ability and desire to apply himself, how ingenious he is, and the extent to which he is able to cooperate with those around him. In the course of a few months it will be evident whether he is able to go ahead or whether his chances of advancement are poor and a change would be desirable. His work in this section lasts for varying periods of time, depending on the rate of his development and on the requirement for men in other lines of work which I will describe.

The work of the research divisions is classified under various categories such as (a) control of going processes, (b) improvement of going processes, (c) additions to present lines, (d) new ventures and lastly (e) fundamental research in pure or applied chemistry. The percentage of the total research force delegated to these categories varies, but in general comparatively little work is carried out in categories (a) and (b); a predominant amount in (c); an increasing amount in (d)and only a moderate amount in (e). Since the majority of the work of the research divisions is of a purely developmental nature, requiring expert technique and extensive background of experience, it is obvious that it is essential to have it carried out either by or under the immediate direction of the older men. In order to replace those who drop out or to make it possible to increase the volume of this work it is necessary to add to the force from time to time. At present this is done in two ways. It is our custom to have new Ph.D's. go directly into the research divisions. The second source of new men is the analytical section which I have described. The choice of a man from the analytical division is made first, in order of seniority, and second, on individual qualifications for the position that is open. It is attempted to place the man where he apparently will be happiest and be in a position to develop best and become most valuable both from his own and the company's standpoint.

Association Helps Develop

I might take this occasion to say that personally I believe it would be to the ultimate advantage of the Ph.D. if he too could be given training in the analytical division since the analytical approach to research problems has been demonstrated to be most fruitful. So far we have not been able to devote the necessary time to this training of Ph.D. chemists. In either case the new man starts to work with one of the older chemists. At first he is given a series of reactions or processes to carry out. He is closely watched and where faulty, his technique is corrected. Within a reasonable period of time he is able to do the work satisfactorily and is then ready for research and development work on new processes. For some time this is carried out under the direction of the older man but finally when obviously qualified, the new chemist is ready to go it on his own, reporting directly to the Division Head. The length of this training varies according to the individual and is usually longer for the four and five year men than for the Ph.D's.

What the Young Chemist Must Do

During this period of training, it is of greatest importance that the chemist realize his lack of knowledge and capitalize to the utmost the expert guidance which is at his disposal. He should approach his task with an aggressive desire to learn and should thoroughly study the literature pertaining to his field. He learns the controlling factors in obtaining high yields and good quality and is able to choose those methods which have the best economy both considered alone and in connection with other products being manufactured. His growth is in his ability to quickly arrive at the solution of a problem, while at the same time choosing that procedure which is fundamentally of greatest economy. He is a pioneer and his efforts frequently result in patentable processes which constitute the basis of a monopoly which in turn yields the richest profits. He should learn to analyze a problem and to systematically plan his work so that to a large extent his actual experiments are to confirm an idea or fact rather than that from a large number of experiments he should be able to deduce a fact. It is not by any means a training solely in the use of his hands or in the accumulation of a fund of highly specialized facts. It is a period of mind training which is a continuation of that training which the college should really aim to give its students.

It takes all kinds of men to make the world and this is fortunate. Some of the research chemists will always be individual workers while others exhibit the ability to handle many problems and ultimately are able to go into managerial positions. It should not be assumed, however, that financial success is predicated solely on being able to go into executive work. Some of the most inventive chemists are those who shun personal contacts and office work. They contribute in an important way to the success of the developmental work. We could not get along without the genius. It is desirable, however, to live harmoniously with others and the ability to cooperate is a vital part of the chemists' training. Too often an individual gets the idea that he can go it alone but

finds in the end that he *is* alone and pretty much out of the picture. Individual effort persists until his extensive background and his outstanding organizing ability fit him to lead others and direct their work in a more coordinated whole. He then becomes a section leader, or an assistant division head—later a division head, then assistant laboratory director and then laboratory or chemical director.

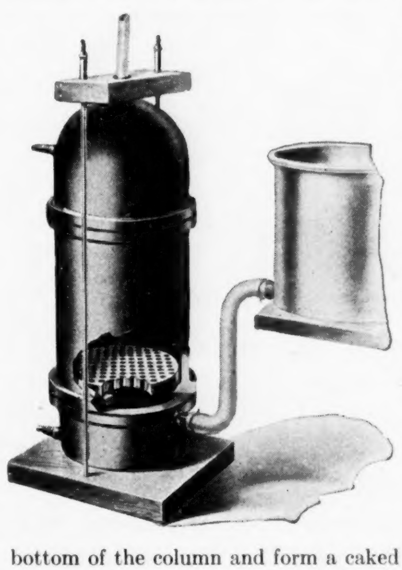
Another phase of the activities of the chemist in the Dyestuffs Department is in connection with the manufacturing end of the business. The plant is organized along lines very similar to those I have described in the research laboratory. It is composed of areas, again based on the natural divisions of the work. Roughly, these manufacturing areas correspond in subject matter to the divisions of the research laboratory. Each area has its own control laboratory in which the routine analysis of raw, semi-finished and finished materials is carried out as well as a certain amount of research work designed to improve the efficiency of the various operations. These laboratories handle the bulk of category (a) work and a fair proportion of (b).

Long ago it was decided that the manufacturing operations could be carried on most efficiently by highly trained chemists and the results in the last 12 years have amply substantiated this belief. We find, therefore, in the plant organization, a large number of chemists. Some are in the plant laboratories and some are in actual charge of one or more operations. Most of the chemists in the plants came from the research laboratories, a few having been taken in from outside of the Company by virtue of experience gained with other companies. Many of the operating chemists were formerly in charge of divisions in the research laboratory and their collegiate training ranges from the four year degree to the Ph.D. New chemists are obtained from either the analytical or research divisions of the research laboratory depending on the nature of the position to be filled. When they arrive they are familiar in a general way with the handling of large operations but must be trained in the particular processes being operated. Eternal vigilance to detail, the rigid control of purity, the prevention of mechanical loss, the efficiency of labor, the health and safety of the men, the economical treatment of repairs and replacements—all these must be mastered and much can be learned from the guidance and training given by the older men. Here, perhaps more than in the research laboratory, it is necessary to develop proper human relationships. The plant chemist has to deal with the research man who develops and hands over to him a process that is supposed to work. He must check it to be certain that he personally can operate it and obtain the desired results. He must maintain the proper contacts with the service departments so that his materials are on hand and his equipment in good operating condition. He must maintain the right spirit in his workmen. He must satisfy his superiors that maximum efficiency and minimum costs are realized. He must keep in touch with the technical and sales departments to make certain that he understands their requirements and delivers the desired amounts of products of high quality. Many times he contacts the customer in order to appreciate his needs or to solve the difficulties with the products he has sold.

The plant chemist grows in direct proportion to his ability to obtain high efficiency and this in turn is a direct reflection of his ability along the lines of chemistry, cooperation, originality, energy and integrity. His route of progress is from assistant supervisor of one operation to complete charge of it—then to several operations, next an entire building, then an area of related products, then general production or chemical superintendent, assistant plant manager and finally plant manager. It is a route of constantly increasing responsibility and effort and, of course, of increasing recognition and financial return. His success depends on himself first of all but next on his training and to this extent his employer is responsible for his success. His progress is beset by trials and tribulations, it is sweetened by the thrill of achievement, lifelong friends are made, independence is acquired and a satisfaction comes from the knowledge that one's best efforts have been expended and the goal reached to the best measure of one's ability.

Equipment Ideas

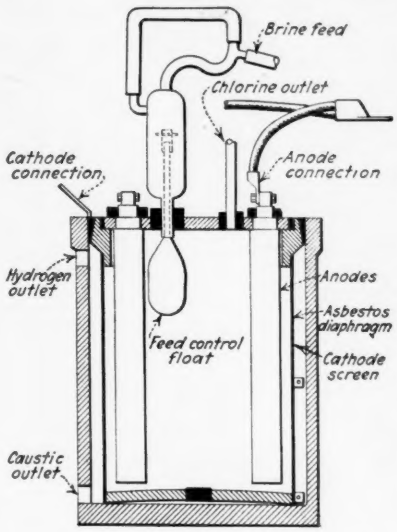
General Ceramics Co., 71 W. 35th St., N. Y. City, is now producing a new hydrogen sulfide generator designed by Prof. H. H. Barber, University of Minnesota. It is easy to fill and clean and does not clog. There can be no back pressure of gas to cause the hydrogen sulfide to escape into the room, with attendant dangerous, disagreeable and ill effects. It occupies only small space. Is practically indestructible. And the cost is low.



Generators which feed the acid onto the ferrous sulfide at the top of column, stop generating hydrogen sulfide as soon as the fine ferrous sulfide and insoluble material are carried to the bottom of the column and form a caked mass, as that stops the flow of acid over the ferrous sulfide. This hard cake must then be removed before the generator will again operate.

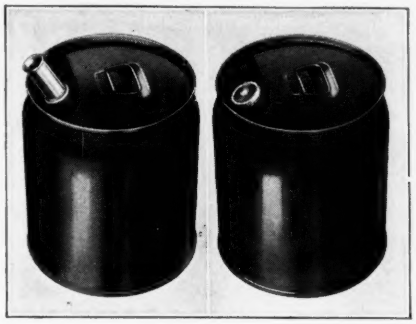
This Generator is made of acid-proof chemical stonewear, vitrified all the way through. It does not depend on an applied glaze or veneer for its acid-resisting properties. It is guaranteed to be tight, non-porous and impenetrable by the acids used.

Stoneware Electrolytic Cell

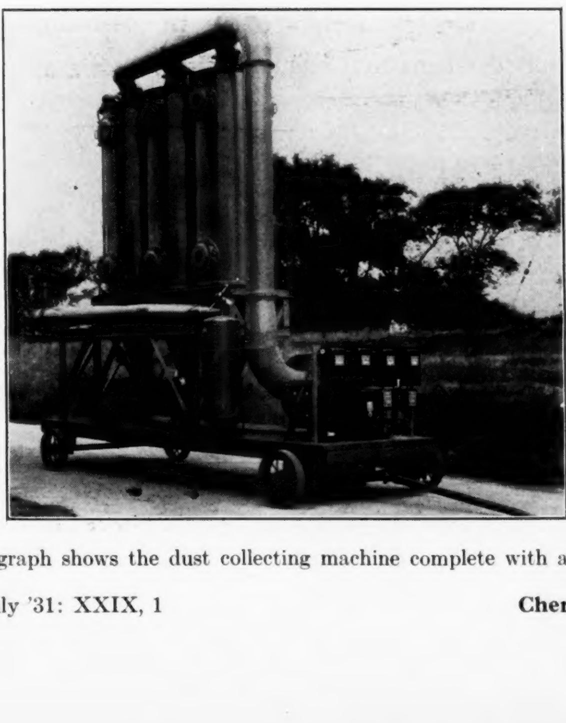


The U. S. Stoneware Co., 50 Church St., N. Y. City, has announced a new laboratory electric cell for chlorine and caustic soda. The cell is of the Vorce type and is made in one size, 11 in. in outside diameter, for current rates running between 150 and 50 amp. This company has also announced a new quick setting cement, "Vitric 10".

Geuder, Paeschke & Frey Co., Milwaukee, announced the development of a new convenient pouring container for paints, varnishes, oils, chemicals and other liquid products. This container,—called the Pour-Klean has part of the top deflected at a 45-degree angle, out of which a pouring spout extends which for shipment and when not in use telescopes inside the container top. When in use, the spout is simply pulled out to full length; because of the slanted portion of the cover, the spout then stands tilted, the end just clearing the container's side wall. The spout is held firm by bearings above and below the ring; it measures 45 m.m. in diameter.

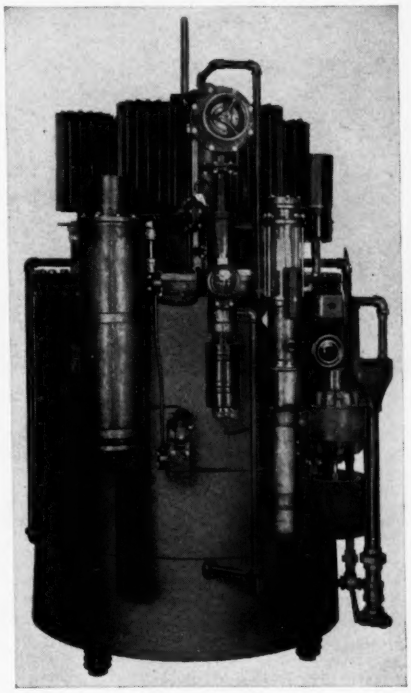


The Dust Recovering & Conveying Co., Cleveland, Ohio, is now producing a portable dust collector. The accompanying photograph shows the dust collecting machine complete with auxiliary equipment. The intake manifold for the gas or dust source faces the rear of the truck and has a short vertical connection for atmospheric air where this may be necessary for cooling. The dust is removed from the gas or air in the three standard Dracco filter compartments and the cleaned air is withdrawn through the exhaust manifold and fan. A screw conveyor discharges the collected material through a box at the rear of the truck. At the front are the starting boxes for the motors which drive the exhaust fan, air compressor, screw conveyor, and automatic filter cleaning mechanism.



New Mercury-Arc Rectifier

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has announced The Steel Tank Mercury-Arc Rectifier, which converts alternating to direct current over wide ranges of both voltage and current. The most general use of this equipment is in supplying power for electric traction systems, although it has certain industrial applications For some electrochemical processes, the power supply requirements are such that rectifiers provide the preferable means of conversion.



The operation of these rectifiers is based on the principle that in an ionized gas only a small positive potential with respect to the gas is required to cause current to flow to an electrode while a large negative potential can be applied before appreciable current flows. The rectifier consists of a mercury pool cathode and an anode inside a steel tank, with facilities for condensing the mercury vapor, and the necessary auxiliary apparatus for maintaining the vacuum and temperature conditions of the rectifier within the limits required for proper operation.

Continental Diamond Fibre Co., Newark, N. J., is now in production on Dilecto K-4 is a new insulating material. In addition to unusually high electrical insulating properties, Dilecto K-4 high thermal insulating efficiency, is odorless, and does not attract odors. It is finding a wide use as breaker strips on electric refrigerator cabinets. Dilecto K-4 is also highly resistant to alkali solutions, and to water and moisture. This material will be made in sheets, rods, and tubes. It can be machined readily.

Mellon Institute of Industrial Research, Pittsburgh, Pa., has just issued the Fourth Annual Supplement to its *Bibliographic Bulletin No. 2.* This supplement lists the books, bulletins, journal contributions, and patents of the institution's members during the calendar year 1930.

The Institute has also published the *18th Annual Report* of its director, Dr. E. R. Weidlein, to the board of trustees of the institution, which describes the investigational activities throughout the fiscal year, Feb. 28, 1930, to Feb. 28, 1931.

EXPEDITIONS THAT BEGIN WHERE KNOWLEDGE ENDS

THE Chemist is constantly pioneering into a wilderness. Taking off from knowledge, he pursues his reasoning into the unknown—and opens new trails for the world to follow.

Thus in their laboratories today, Industry's chemists are working out applications of substances known as Aroclors. They are finding out many things about them. And what they learn will result in a whole new group of products, and betterment for a large number of existing products.

This new ingredient exists because a great industry needed Diphenyl, from which Aroclors sprang. Swann Research found a way to take Diphenyl out of the laboratory, and produce it commercially—to bring its price within reach of Industry. Aroclors followed. From this new outpost of knowledge the Chemist is now pioneering into realms that have no known boundaries.

Swann Research, producer of Diphenyl, Aroclors and many other products formerly out of practical reach, stands ready to help you solve your problems as it has helped many of America's industrial leaders.

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Chemical Facts and Figures

Sen. Bingham Proposes Curb On "Volatile Poisons"—du Pont Sues Glidden—New Alcohol Formula—Victor Buys Globe—New Methanol Agreement.

"Summer dullness" was not apparent in the chemical news of the month. While tonnages revealed a period of further restriction, developments of major importance were in evidence. Senator Hiram Bingham (Conn.) provided most of the fireworks in the form of a proposed bill designed to regulate interstate commerce in poisonous volatile substances. In addition, du Pont announced that it had commenced action against Glidden for alleged infringement of the du Pont lacquer patents (See Chemical Markets, June, p 625; also, April, p. 384), Victor announced the purchase of Globe Phosphate lands assuring the company of at least 75 years' supply of rock, and in Washington the Bureau of Industrial Alcohol of the Treasury Department advised that effective July 15, a new formula of completely denatured alcohol would be available to the industry. On June 2, Canada increased its tariff rate on several chemical items.

Volatile Poison Act

The proposed legislation initiated by Senator Bingham has aroused the chemical industry and undoubtedly strong opposition will develop between now and December to bring about its defeat. The first part of the proposed bill defines the term "poisonous volatile substance" as follows:

"That, as used in this Act:

(a) The term 'poisonous volatile substance' means any volatile substance, or any material containing any such substance, in the form of gas, liquid or solid, the fumes or vapors from which may endanger human life."

Then follows the most important section of the bill and the one which will arouse considerable agitation because of the arbitrary powers granted to the Secretary of Agriculture. It is as follows:

"Sec. 2. No poisonous volatile substance shall be shipped or delivered for shipment in interstate or foreign commerce or received from shipment in such commerce for sale or exchange, or sold or offered for sale in any Territory or possession or in the District of Columbia, unless and until (a) The Secretary of Agriculture has caused to be made an examination and analysis of a sample of such substance and is of the opinion that such substance is suitable for domestic or household use without endangering human life, and has issued a special permit to that effect for such period as he may prescribe, and (b) the parcel, package, container, machine or apparatus containing such substance, bears a proper label."

While methanol is not mentioned specifically in the proposed measure, which is to be designated as the "Federal Volatile Poison Act" it is thought in most quarters that the bill is aimed at the regulation and quite probably the elimination of synthetic methanol as an anti-freeze, thus giving to this debatable question still another angle.

Several prominent members of the industry when interviewed expressed the opinion that the bill was a dangerous one and a number further expressed it as their opinion that if passed it would be declared unconstitutional. With powers so broad and the wording "suitable for domestic or household use" strictly interpreted it is difficult to see how the entire chemical industry would not be affected, for a large number of industrial chemicals are both poisonous and volatile and unsuitable for domestic use.

THE MONTH REVIEWED

June

2	Canada raises tariff rate on several chemicals. (66)
8	Copper sulfate is reduced to \$3.70. (81)
9	U. S. Tariff Commission to investigate flaxseed and Linseed Oil. (67)
18	Draft of Proposed "Federal Volatile Poison Act" made public. (65)
19	Synthetic Nitrogen Conference adjoins. (26)
20	Victor Chemical Works announces the purchase of lands from Globe Phosphate Co. (67)
22	Foreign Chemical Companies maintain dividends. (75)
24	American Cyanamid reduces capital to \$10 a share for both A & B com. (73)
25	Treasury Dept. announces new completely denatured formula effective July 15th. (66)
25	DuPont enters suit against Glidden alleging infringement of lacquer patents. (66)
25	U. S. I. Passes quarterly dividend on common stock. (74)

Henderson Explains

In support of his measure Senator Bingham has made public a letter written by Dr. Yandell Henderson of the Yale University Laboratory of Applied Physiology, extracts of which are as follows:

"The Federal Volatile Poisons Act, which you (Senator Bingham) propose to introduce in the United States Senate at the opening of the next session of Congress, is greatly needed for the protection of the lives and health of the American people. It will be of high value not only in the territories and District of Columbia and in interstate trade, but also as a model for similar legislation by the several states."

"This federal act to control volatile poisons which at your request the legislative counsel of the Senate has drafted along lines which it has been my privilege, at your request also, to suggest, does not undertake to regulate the conditions of manufacture of volatile poisonous substances. That aspect of sanitation is taken care of by state factory legislation and supervision. This act does not prohibit the manufacture or sale of any substances that may be useful. It does aim, however, to protect the general public against the hazards to health and life when poisonous volatile substances are used improperly by persons ignorant of their danger. To this end the act provides that the Secretary of Agriculture shall have analyses and other scientific examinations made of all volatile poisonous substances or mixtures sold in the territories or District of Columbia or entering interstate trade, and that with the advice of a board of eminent scientific men the Secretary shall define the condi-

tions in respect to labeling and other regulations under which the materials may be sold without endangering the health of the people of the United States."

du Pont Sues

Another step was taken in the lacquer controversy when the du Pont Co., on June 25 released the following statement to the trade papers:

"Suit has been brought in the United States District Court for the Eastern District of New York by E. I. du Pont de Nemours & Co. against The Glidden Co., alleging infringement of Du Pont's Duco Patents, Flaherty Reissue No. 16,803 and Hitt No. 1,710,453, process having been served on the Defendant on June 17th.

Du Pont is represented in this litigation by Mr. Charles Neave of the firm of Fish, Richardson and Neave, No. 20 Exchange Place, New York City."

Evidently it is the intention of the du Pont interests to make this a test case of the validity of the patents and to clear up the question of the license agreement as announced in CHEMICAL MARKETS in April, page 290.

Patent Opposition

Announcement was made on July 3, by the firm of Singmaster & Breyer, that a new draft for the formation of a Lacquer Patents Association has been made eliminating the features that were objectionable to several of the lacquer manufacturers. (See Chemical Markets, June, p. 625).

An independent body of five trustees have been appointed and a fund for them to work with has been established. To date $38,000 has been subscribed and present plans call for raising a sum between $50,000 and $100,000. The trustees are as follows: Adrian D. Joyce, president, Glidden Co.; Wm. M. Rand, vice-president, Merrimac Chemical; L. Phillips, president, Valentine & Co.; Wm. C. Dabney, vice-president, Jones-Dabney Co.; W. Y. Longsworth, Secretary-General Manager, Lilly Varnish Co.

Provision has been made in the new proposed agreement permitting smaller lacquer manufacturers to join by subscribing as small a sum as $100. It is probable that signers will be asked to subscribe at the rate of $100 for every 10,000 gallons of lacquer produced. A specially important change has been made in the agreement which limits the financial responsibility of the companies contributing to the definite amount subscribed.

Outside Help

Raw material manufacturers and also large users of lacquer are to be approached for financial help and the backers of the movement report that both the Hercules Powder and American Cyanamid Companies will support the movement. It is said that the proposed Association will attack the du Pont licensing agreement as an attempt to control prices and further claim that they have unearthed sufficient evidence of priority to defeat the suit against the Glidden Co., which the du Pont Co., has instituted evidently as a test case. This suit promises to be one of the most important patent litigations, greater even than those involving diphenylguanidine and phthalic anhydride.

In the announcement signed by Frank G. Breyer of the firm of Singmaster and Breyer and mailed to over 400 lacquer manufacturers he summarizes the position of those opposing the patents as follows:

"The du Pont Co. claims that its five lacquer patents are valid to dominate the industry. It proposes to use these patents in a way which it claims will put the entire lacquer industry on a more profitable basis for all concerned. This is to be effected by a series of steps, the first of which is to secure all the important members of the industry as its licensees. License agreements to this effect have already been sent to a limited number of lacquer manufacturers and a certain number of them have been executed in acquiescence with the furtherance of this plan."

"Many lacquer manufacturers do not want market and price control by duPont. No one has to take a license under these patents unless for business reasons he wants to. This conclusion is the result of a most careful investigation of them prior art and the defenses possible."

"But if any may wish to take a license for business reasons, most serious objections will immediately appear. The product of each manufacturer will have to be arbitrarily classified by the du Pont Co., and prices set for each class. Classification and standardization will introduce artificial factors into an industry in which quality and service have always been the determining points. Customers must be satisfied that they will receive just treatment and that large consumers producing their own lacquer will not obtain an additional advantage."

Canada Tariff Rates

Premier Bennett announced on June 2, several increases in the tariff duty effective at once. Those of a chemical nature are listed giving the old and the new rate. The new regulations contain a provision providing that the carton or other container is now considered as dutiable weight.

	General New Rate of Duty	*General Old Rate of Duty*
Beeswax	20%	10%
Glucose	1¼c per lb.	62½c per cwt.
Regenerated cellulose	10%	17½%
Ethylene glycol	Free	
Sal soda	3-10c per lb.	Free
Disinfectants in 30-lb. packages	25%	Free
Whale oil	30%	22½%
Magensite, etc.	30%	Free and 25%
Feldspar	30%	15%
Charcoal	7.50 per ton	17½%
Unenumerated articles	25%	17½%

Washington

After several months of agitation against the use of alcotate as a denaturant in industrial alcohol the Bureau of Industrial Alcohol in cooperation with the Treasury Department has announced that an entirely new formula will be available to the trade on and after July 15. Opposition came chiefly from the manufacturers and users of shellac where the odor was so disagreeable as to cause real distress and hardship. The full text of the order is as follows:

Effective July 15, 1931, completely denatured alcohol formula No. 5, will be compounded as follows:

To every 100 parts by volume of ethyl alcohol of not less than 160 degrees proof, add five parts by volume of denaturing grade Isopropanol; 75 parts by volume of a compound or one similar thereto known as Aldehol Grade A; 75 parts by volume of the compound or one similar thereto known as Alcotate; 25 parts by volume of commercial Alpha Terpineol.

(Signed) J. M. Doran, Commissioner of Industrial Alcohol.

Approved: June 25, 1931. Ferry K. Heath, Acting Secretary of the Treasury; William D. Mitchell, Attorney General.

Methanol Agreement

An agreement was reached (June 24) between the United States Public Health Service and manufacturers of methanol and of antifreeze mixtures containing methanol. Containers of methanol or mixtures containing more than 15 per cent of methanol, sold for any purpose, must be labeled "Poison," and all antifreeze mixtures containing more than 15 per cent of methanol must also be colored with methyl violet and must contain tartar emetic, tear gas, ethanolamine, and water. The requirements with respect to methanol antifreeze will become effective July 1.

It has also been agreed between the manufacturers and the Public Health Service that there will be no new extension of the use of methanol in industry until the conditions under which the substance can be used safely shall have been "scientifically established."

A large number of manufacturers of methanol and of methanol antifreeze have accepted the regulations of the Public Health Service, and officials of the service have expressed the opinion that all the important domestic sources of methanol will be covered by the provisions of the agreement.

Complete copies of the new regulations are now available.

The Department of Justice announced during the month that it will not appeal the decree recently rendered in the case of the merger of the Socony-Vacuum Oil case This was looked upon as a con-

structive measure and one clarifying the government's position.

The U. S. Tariff Commission has issued a report (June 4) summarizing the activity of the Commission for the past year. Announcement was made on June 9, of a proposal to investigate flaxseed and linseed oil. The application on flaxseed was made by the Association Nacional de Agricultura, of Buenos Aires. A decrease in the rate of duty was requested.

The Commission's decision to order the investigation of linseed oil was reached after consideration of the close relationship of the duty on the raw material, flaxseed, and the finished product, linseed oil.

Also an investigation of the foreign and domestic costs of producing crude and ground feldspar has been ordered (June 17) by the U. S. Tariff Commission on application of the Consolidated Feldspar Corporation, East Liverpool, Ohio. The applicant asked a decrease in duty, which is $1 per ton on the crude under the 1930 tariff act. The article was peviously free of duty.

Victor Purchases Globe

One of the largest remaining unmined tracts of high grade phosphate rock in the state of Tennessee was recently purchased by the Victor Chemical Works, of Chicago, from the Globe Phosphate Co. for an undisclosed consideration. A substantial increase in the mining properties of the Victor Chemical Works has been advisable because of the highly successful operation of their pyrolitic furnace at Nashville. This furnace is the largest single phosphoric acid producing unit in existence and as such requires enormous quantities of phosphate rock.

The Globe property is located in Maury County about four miles southeast of Mt. Pleasant, Tenn., and about 60 miles from the Nashville plant of the Victor Chemical Works. Railroad connections (via the Mt. Pleasant & Southern RR and the Louisville & Nashville RR) already exist between the mine and the Victor Works.

Raw Material Insurance

Just prior to the consummation of the deal, the entire tract, which comprises approximately 2,500 acres, was thoroughly prospected by Victor engineers. (See rotogravure section). The result of this prospect conclusively substantiated previous reports to the effect that the property is exceedingly rich in high grade phosphate rock. It also indicated that this deposit together with other mining properties owned by Victor assures them of a source for their most important raw material for an estimated 75 years to come.

The acquisition of this property is of strategic importance in forwarding a conservative yet commendably progressive plan of expansion that has placed the Victor Chemical Works in the ranks of the country's leading factors in the chemical industry.

Sulfur Valuations

Texas Gulf Sulphur Co., is reported as having come to an agreement with the County Board of Wharton County, Texas, in the matter of valuation of its properties held in the county. The matter has been one of controversy for a long period. Attorneys for the Texas Gulf Sulphur Co. accepted a valuation of $16,041,540 upon its land and other property, representing an increase of $2,284,874 over the 1930 figures.

The 1931 valuation was set by the Board of Equalization for Wharton County, Texas, consisting of County Judge Morris and members of the Commissioners Court. The valuation, according to Judge Morris, represents sulphur, mined by the company since January 1, but not yet shipped out of the State, as well as the increase in the value of the sulphur-bearing lands. The company's gross taxes therefore will be $481,245 this year.

Freeport Contests

Freeport Texas however has signified its intention of disputing the valuation paid on its properties in Brazoria County and further hearings are scheduled to take place in the near future. The Company denies the valuation placed upon its properties in Brazoria County, which was fixed by the Equalization Board in that locality at $36,000,000 after appraisers had valued the holdings at approximately $100,000,000. This was later reduced to $18,000,000.

Officials of the sulfur company, according to the county officials, are seeking to have the assessment lowered this year to $9,000,000, approximately the amount of dividends paid during 1930 on its holdings.

COMING EVENTS

American Chemical Society, Hotel Statler, Buffalo, August 31 and September 4.

American Paint and Varnish Manufacturer's Association, Drake Hotel, Chicago, Dec. 2-3.

The Electrochemical Society, Hotel Utah, Salt Lake City, September 2-5.

National Paint, Oil and Varnish Association, Atlantic City, N. J., Oct. 5-8, Hotel Ambassador.

Salesmen's Association, Second Golf Tournament, Lennox Hills Country Club, Farmingdale, L. I., July 22.

Personal

August Kochs, president, Victor Chemical Works, sailed June 19 on the "Europa" for a two months' trip abroad. Mr. Kochs plans to visit England, Ireland, France, Switzerland and Germany, returning to this country sometime about the last of August.

J. Passmore Elkinton, sales director, Philadelphia Quartz Co. and vice-president of the Philadelphia Quartz Co., of California has just returned from a five months' trip to the Philippine Islands, China, Manchuria and Japan.

Dr. Arthur D. Little was honored at the 177th commencement exercises of Columbia University in New York on Tuesday, June 2, when he received the honorary degree of Doctor of Science. In conferring the degree on Doctor Little, President Nicholas Murray Butler made the following comment:

"Native of Massachusetts; a captain in the organization and direction of research in the science of chemistry in all its manifold revelations; covering in his field of interest and influence almost every aspect of chemical engineering practice; fertile in invention, practical in application and a genuine leader in the preservation and advancement of that organized body of knowledge which we know as science; one who, as even Sir Humphrey Davy would admit, pursues science with true dignity." Dr. Little is a consulting editor of CHEMICAL MARKETS

Mr. A. C. Fieldner, chief engineer, Experiment Stations Division, United States Bureau of Mines, Washington, D. C., was awarded the Lamme Meritroious Achievement Medal by the Ohio State University on June 8. This gold medal, awarded annually to a graduate of one of the departments of the university for meritorious achievement in engineering or the technical arts, was established by the will of the late Benjamin G. Lamme of the engineering department of the Westinghouse Electric and Manufacturing Company.

Winners at the Salesmen's first golf tournament at Canoe Brook, June 23 were as follows:

Low gross, Al. Alvarez, of Grasselli the association's 1930 champion, 86; second low gross, C. S. Benjamin, of General Chemical, 88; third low gross, Stanley M. Weil, President, Natural Products Refining, 92; fourth low gross, Richard Noonan, of Drug Products, 102; low net, F. H. Leppart, of Columbia Alkali, 72. Second low net, Edward Burke, Jr., of Edward S. Burke, 63.

For the third month within the past seven months all Hercules Powder Co. operations were conducted without a lost-time injury. Eleven explosives plants, a nitrocellulose plant, a cotton purification plant, two naval stores plants, four wood camps and two experiment stations worked throughout the month of May without an accident.

The Pennsylvania Sugar Co. has purchased the name, goodwill, trademark and other assets of Fineart Foods, Inc. The latter company is a manufacturer, refiner and distributor of concentrates of tea and coffee and a producer of fruit and vegetable juices.

The acquisition results in a much larger field of activities for Pennsylvania Sugar, which has heretofore restricted its business to production of sugar and alcohol.

Barclay Chemical Co., formerly at 154 Chambers St., N. Y. City, is now at 156 Chambers St., where the entire 6th floor is occupied.

Niacet Chemicals Corp., New York and Niagara Falls, N. Y., has announced that it is now producing a grade of paraldehyde conforming to all the requirements of the United States Pharmacopoeia. The manufacture of technical and refined paraldehyde will be continued as heretofore. These are suitable for all commercial uses and the U. S. P. grade will supply the demands of the pharmaceutical and medicinal trade.

The offices and warehouses of the U. S. Industrial Alcohol and the U. S. Industrial Chemical Companies which have been located at 3652 Archer avenue, Chicago, since 1923, will be located after June 29 on the fourth floor of the Midland Warehouses at 15th and South Western Avenue.

The American Smelting and Refining Co., announced June 17, that it would close its lead smelters at Murray, Utah, and East Helena, Mont., in July, August and September.

The warehouse and sales office of the Rossville Commercial Alcohol Corporation was moved from the Bush Terminal Building, Brooklyn, to their plant at Blanchard street, Newark, July 1.

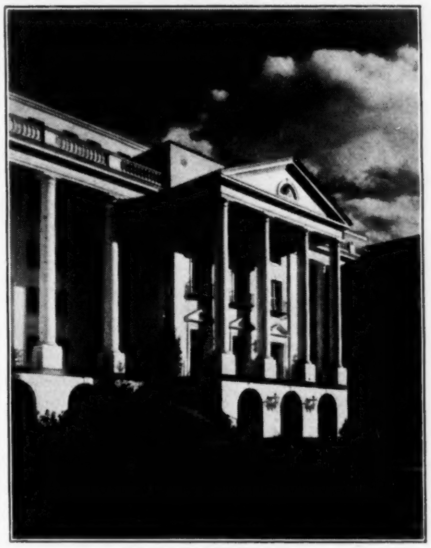
In order to prevent any expense on the part of their customers in the New York or Brooklyn territory they have provided two telephone trunk lines which will enable those wishing to communicate with Newark to make their calls at the usual local rate. The new telephone numbers are Hitchcock 4-0486 and 4-0487.

Company News

The Ahumada Lead Co. has suspended operations indefinitely.

Three million gallons of denatured alcohol were loaded on board the tanker Meton recently for New Orleans by the Publicker Commercial Alcohol Co. The ship inaugurated a new service from the port of Philadelphia.

Not only is this the first time that such a quantity of alcohol has been transported in bulk in one vessel, but officials said last night that it was the largest quantity of the fluid ever taken in one bulk shipment of any kind in the history of the world.



Greenbriar, White Sulphur Springs, W. Va. Representatives of the fertilizer companies gathered here the week of June 8

Colgate-Palmolive-Peet Co. has announced the acquisition of Omega Chemical Co., New York, the purchase price being reported as $3,000,000. The Omega Chemical Co. is said to own an interest in Societe Cadum, Paris, which has revived reports of interest in that company on the part of Colgate-Palmolove-Peet.

Mitsui & Company, Ltd., formerly of 65 Broadway and 180 Madison Avenue have occupied their new quarters in the Empire State building, 350 Fifth Avenue, New York City.

Innis, Speiden & Co.'s Philadelphia offices are now located at 401 N. Broad St.

Taylor Lowenstein & Co., one of the largest naval stores factors in the South, has signed up as a member of the co-operative marketing organization that is attempting to put the industry on a sounder basis.

On June 1st Monsanto's unit for the production of Chamber sulfuric acid resumed operations after an idleness of six months. During June Monsanto's heavy chemical plant at Monsanto, Illinois, ran at 80% of capacity against 76% for May.

Employment at this plant has steadily increased and is now 31% above the low point which was reached on February 1st of this year.

The Oklahoma plant at West Tulsa of the Texaco Salt Products Co. will start operations immediately for the production of sodium chemicals for industrial use. Five large special evaporators are under construction which employ the Martin process developed by Dr. Otto V. Martin, who will be in charge of operations.

Equipment

The new Procter & Gamble Plant at Long Beach, California, considered the most modern soap factory in America, is equipped with Shriver Filter Presses.

Informal discussions are reported as being held between Westinghouse Electric & Manufacturing Co. and bankers interested in International Combustion Engineering Corp. with a view to the purchase by the former of certain assets of Combustion. About a year ago, a few officials of Westinghouse Electric inspected the properties of Combustion, but nothing materialized at that time.

In the interim, Foster Wheeler Corp. was actively interested in acquiring the properties, but terms suitable to both interests could not be agreed upon and the plan was abandoned.

Weston Electrical Instrument Corp. has concluded a contract to purchase the assets and business of Jewel Instrument Corp., of Chicago. The terms include payment by Weston of approximately $500, 000 in cash and 14,000 shares of Weston common stock. The quick assets to be obtained are about equivalent to the cash payment, and will leave Weston's net working capital position intact.

Jewel Instrument is a manufacturer of various meters, including voltmeters and ammeters, or a line similar to that of Weston, although in a lower price range. It will be operated as a wholly-owned subsidiary of Weston.

Pfaudler Company, Rochester, N. Y., has made new appointments as follows: H. S. Calvert, executive vice-president in charge of sales developments; George F. Kroha, vice-president and general sales manager; George C. Calvert, assistant general sales manager; R. Miner, foreign sales director; Philip S. Barnes, manager

of sales chemical division; and William H. Klee, manager of Midwest sales.

Sharples Specialty Co., Philadelphia, has appointed Weaver L. Marston sales manager with headquarters at the main office at 23rd and Westmoreland Streets.

F. J. Stokes Machine Co., of Philadelphia has announced that its plant and office will be closed for vacation the week of Aug. 17-23. A skeleton force will be maintained for emergencies.

Allied Changes

Announcement was made July 2 of the retirement of Clinton S. Lutkins as vice-president of Allied Chemical and Dye Corp. Several other resignations were also reported including G. M. Wells, vice-president, J. N. Ford, treasurer. Coinciding with these resignations several rearrangements of department heads in both Solvay and Barrett were effected.

Obituaries

John W. Daniels

John W. Daniels, chairman of the board and one of the founders of the Archer-Daniels Midland Co., of Minneapolis, died June 8, after a month's illness.

Mr. Daniels was born on Feb. 23, 1857, at Piqua, Ohio, educated in the public schools of that city and after graduation wandered from job to job until he was 21. He started work in a Piqua linseed oil factory and he learned the business from the grinding rooms to the executive offices.

Later he became associated with the American Linseed Company and remained at Buffalo for two and a half years. In 1901 he was general manager of the linseed oil department of the Sherwin Williams Company in Cleveland.

In 1902 he moved to Minneapolis to build a mill that was nearer the source of flax production. His first company was the Daniels Linseed Company, which a year later became the Archer-Daniels Company when he joined forces with Shreve M. Archer Sr. The firm prospered and in 1923 had so expanded that it took in the Midland Linseed Products Company of Minneapolis and became the Archer-Daniels Midland Company, today one of the largest linseed oil manufacturers in the world.

Mr. Daniels took a great interest in art and made several trips to Europe, where he studied collections of paintings in noted galleries.

Mr. Daniels was a member of the Sons of the American Revolution and University Club, White Bear Yacht Club and Minneapolis Club.

He is survived by his widow and son, Thomas L. Daniels.

Frank Hemingway

Frank Hemingway well known chemical manufacturer died on June 29, aged fifty-six years.

He was president of Robinson, Butler, Hemingway & Co. of Bound Brook, N. J., and Birmingham, England, and of the Tar Distilling Corp., and vice president of the Inland Tar Co. of Chicago.

Mr. Hemingway was known as an authority on coal-tar derivatives. He had served as treasurer of the American section of the Society of Chemical Industry since 1908. He was a fellow of the Chemical Society of London and of the American Electro-Chemical Society and a member of the American Institute of Chemistry. He also was a member of several clubs.

He was born in London in December, 1876, and came to this country at the age of 21, starting work in St. Louis. In 1913 he moved to Bound Brook and became president of Hemingway & Co., manufacturers of oxides and coal-tar intermediates. For several years he was manager of the development department of Sherwin Williams.

Personnel

George M. Moffett, vice-president of the Corn Products Refining Co. since 1916, has been elected President of the Company to succeed the late E. T. Bedford.

Mr. Moffett who was born at Parkersburg, West Virginia, in 1883 has spent all of his business life in the manufacture of corn products, having started his business career with the old New York Glucose Co., in 1904, the year of his graduation from Princeton University.

When that Company's identity was merged two years later along with several other corn refining interests into the Corn Products Refining Co., he entered its employ as general manager of factory operations. In 1916 he was elected vice-president with general executive duties.

Mr. Moffett worked in close association with Mr. Bedford, and for the past year or two was largely given the direction of the Company's affairs.

Cooper, Diamond Sales Mgr.

George S. Cooper who has been connected with the Diamond Alkali Co., for several years in various capacities in the sales department has been appointed sales manager.

For a number of years Mr. Cooper had been assistant to Fred G. Lancaster, Vice-President in charge of sales, so he brings to his new position a thorough knowledge of the marketing problems of the alkali industry. His headquarters will be at the main offices of the Company in the new Koppers Building, Pittsburg, Pa.

J. A. Rafferty, President, Carbide and Carbon Chemicals Corp., has announced that James W. McLaughlin has been elected a vice-president of the Corporation. This action was taken at a meeting of the Directors on June 18. Mr. McLaughlin has been connected with the Carbide and Carbon Corp., for several years in various capacities and for the past few years has been assistant to Mr. Rafferty.

Equipment

R. D. Bean, formerly Manager of the Engineering Development Department of The Brown Instrument Co., Philadelphia, has been made Chief Engineer of that company. Mr. Bean's extensive field investigations covering many applications of Brown industrial measuring instruments have won him wide acquaintance and his numerous friends will be glad to hear of his promotion.

Announcement of the appointment of P. T. Babcock, eastern representative of the Pressed Steel Tank Co., manufacturers of steel shipping containers, with offices in the Vanderbilt-Concourse building, N. Y. City to have complete charge of all sales has been made by that company. Mr. Babcock will have this headquarters in Milwaukee. Becoming associated with the company in 1919 as a representative in the Chicago territory, Mr. Babcock was later placed in charge of the New York office. Norman A. Evans will now have charge of the direction of the New York offices.

Link-Belt Co., Chicago, has announced the appointment of William L. Hartley as district sales manager in charge of the Detroit territory. He has been in the employ of Link-Belt since 1915, having started in the engineering department, working in the contract, standard and estimating departments.

Roger W. Andrews, now assistant to A. C. Lehman, president of Blaw-Knox Co., has been appointed vice-president and a director of Blaw-Knox International Corp. Mr. Andrews will be in charge of the company's European activities.

Glyco Representatives

New representatives have been recently appointed for Detroit and surrounding territory by the Glyco Products Co.

L. H. Carlson of Detroit Savings Bank Bldg., will have charge of fine chemicals catering to the cosmetic, pharmaceutical, beverage and food products industries.

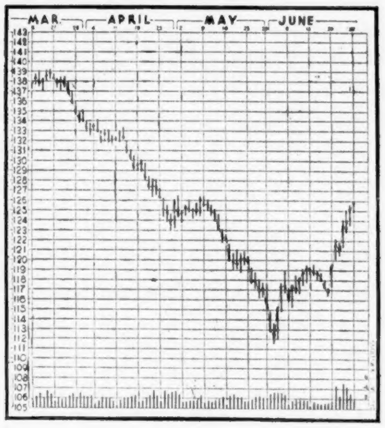
Solvents & Chemicals, Inc., 8747 Brandt Ave. will handle the heavy chemicals for leather, textile, rubber, varnish and other technical industries.

The Financial Markets

Stock Market Registers Impressive Gains—Cyanamid Stockholders Authorize Stock Changes—U. S. I. Passes Quarterly Dividend—Foreign Companies' Earnings in 1930.

Rebounding from the extreme low point of May 29, the stock market staged a sustained rally for the first time in many months, a rally which continued with but slight interruptions throughout the month and brought back stock values so that on the last day of June prices roughly equaled those prevailing at the end of April. It was the first encouraging situation that the Street has witnessed during the present year. Even before President Hoover's debt pronouncement, which did not occur until the last week of the month, the market showed a fairly steady upward trend indicating that the bearish side had been overdone and that even with unfavorable dividend and earning news the public was convinced that stocks were selling too low.

General Market Trend



—*N. Y. Herald Tribune*

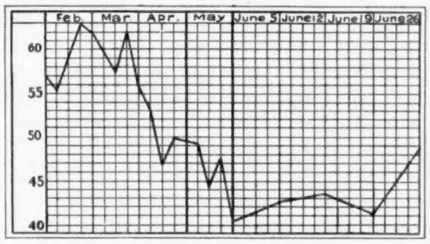
The slight easing off near the end of the third week was instantly changed into a rally of outstanding proportions as the country weighed the President's proposals. In practically every quarter sentiment was changed overnight and a feeling prevailed that the worst of the present depression was now behind. This feeling was further strengthened by the slight upswing in most of the basic commodity indices after months of continuous declines.

Chemical Stocks Advance

Chemical common stocks naturally felt the impetus of the more optimistic feeling and impressive gains were registered. A glance at the accompanying list shows a gain in every instance. In the case of Allied the jump amounted to 26 points, Union Carbide to 4⅝, du Pont, 15⅜ points. Even the copper stocks and some of the alcohol companies showed to better advantage although the gain in U. S. I. was only ¾ of a point due undoubtedly to the unfavorable dividend action on the quarterly common stock dividend due at this time.

Chemical Markets Av. Price

CHEMICAL MARKETS Average Common Stock Price showed a remarkable recovery during June. Chemical stocks moved in unison with the general advance in the market. The average price stood as follows: May 30, 40.27; June 5, 42.31; June 12, 43.26; June 19, 41.24; June 26, 48.99. This was a net gain of 8.72 as against a net loss of 7.10 points in May.



Price Trend of Chemical Company Stocks

Name	*May 30*	*June 6*	*June 13*	*June 20*	*June 27*	*Net Change*
Allied Chem	105	113	119½	113½	131	+26
Air Reduction	74¼	78	80	76½	89	+14¾
Anaconda	22¾	21	21½	20¾	31⅞	+ 9⅛
Columbian Carbon	62	64	68⅞	64	75	+13
Comm. Solvents	11⅜	13	13¾	12⅞	15⅞	+ 4½
DuPont	74¾	80	80⅞	76½	90⅛	+15⅜
Standard of N. J.	33	34	35¼	35	41	+ 8
Texas Gulf	35½	33¼	32½	31½	38	+ 2½
U. S. I.	28¾	30¼	29½	25¾	29½	+ ¾

Cyanamid Stock Changes

American Cyanamid Co. at a special meeting of stockholders held June 24 authorized the reduction of the stated capital to $10 a share for the outstanding Class A and Class B common carried as of July 1 at $53,400,350 and the addition of the amount to surplus which on a consolidated basis was $20,446,026 as of July 1, 1930. It was proposed to make appropriations from surplus as reserves for the following purposes: $4,180,108 for good will, reducing that item to $1; $8,120,246 for reserves against patents and processes reducing that item to $5,000,000, $20,000,000 in addition to the $11,342,470 reserve against property, plant and equipment reducing the net book value of that item to about $22,000,000; $4,000,000 reserve against investment in other companies; $2,000,000 against payment under contracts expiring in 1932 for electric energy not required during the period of depression in the fertilizer industry; and $1,000,000 in addition to the $996,110 reserve for contingencies.

After giving effect to the proposed appropriations, the net book value of the common stock will be approximately $14 a share. It was also decided to change the fiscal year to coincide with the calendar year.

New Highs and Lows

The number after the name designates the number of times new highs or lows were registered during the month.

High

National Lead Pf A . .

Lows

Air Red		Internat'l Salt	
Allied Chem	1	Internat'l Agr. pfd	1
Am. Agr. C Del	1	Liquid Carbonic	
Amer. Smelting	2	McK. & R.	2
Amer. Smelting 6%		McK & R pfd	4
Amer. Sol. & Chem.	2	Mathieson Alkali	
Am. Sol. & Chem. pfd	4	Newport Co	1
Anaconda	1	Proctor & Gamble	
Atlantic Ref.		St. Joseph Lead	2
Atlas Powder		Solvay	
Atlas Powder pfd	1	Std. Oil of Cal.	
Colgate Palm.		Std. Oil of N. J.	1
Colum. Carbon	1	Std. Oil of N. Y.	2
Com. Solv.	1	Tenn. Corp.	
Davison Chem.		Texas Gulf Sul.	2
Devoe & Ray	4	Union Carbide	1
Du Pont DeN	1	United Carbon	
Eastman Kodak	2	U. S. Gypsum	1
Freep't. Tex.		Vanadium Car.	1
Gen. Print. Ink	2	Va-Car Chem.	1
Glidden Co.	1	Va-Car Chem. 7%	
Hercules Powder pfd.		Va-Car Chem. 6%pfd	3
		Westvaco Chlorine	

LOWS FOR EQUIPMENT CO.'S

Foster Wheeler	1	Link Belt	4
Gen. Am. Tank	1	Westinghouse Elec.	
Int. Nickel Pfd.		Worthing Pf B.	

"Cosach" Announces Terms

The Anglo-Chilean Consolidated Nitrate Corp. has received from the National Nitrate Co. of Chile, or "Cosach," the Class B common stock of "Cosach," to which it is entitled under the articles of consolidation approved in April. A total of 8,318,335 shares of Cosach stock was exchanged for the business and practically all the assets of Anglo-Chilean.

W. E. Bennett, secretary of the Anglo-Chilean Consolidated Nitrate, in a letter to stockholders, states: "At meeting of stockholders of Anglo-Chilean Consolidated Nitrate Corporation, held April 17, 1931, a plan of reorganization of this company with Compania de Salitre de Chile—to be known as "Cosach"—was approved. Pursuant thereto all of the business and substantially all of the assets of the company have been transferred to Compania Salitrera Anglo-Chilean, a Chilean corporation, and there have been delivered to Anglo-Chilean Consolidated Nitrate Corporation 8,318,335 Series B ordinary shares of Cosach.

"There is now distributable to the stockholders of Anglo-Chilean, pro rata in accordance with their respective holdings and without the surrender of their stock, 7,027,000 series B ordinary shares of Cosach. Anglo-Chilean will retain for the time being the remainder of the 8,318,335 series B ordinary shares of Cosach received by it pursuant to the reorganization, i. e., 1,291,335 shares, together with the indebtedness not assumed by Compania Salitrera Anglo-Chilean or Cosach, which indebtedness totals $2,661,040, exclusive of interest.

"In order to determine the stockholders of Anglo-Chilean Consolidated Nitrate entitled to receive distribution of such 7,027,000 shares of series B ordinary shares of Cosach (such distribution being at the rate of four shares of Cosach for each share of Anglo-Chilean), the stock transfer books will be closed 20 days from June 18 to July 9, and stockholders of record June 18 will be entitled to receive their pro rata distribution of the 7,027,000 series B ordinary shares of Cosach at the above rate. Cosach certificates will be mailed on June 30 and thereafter. During the 20-day period in which the transfer books are closed, Anglo-Chilean stock will be withdrawn from listing, and the Cosach series B ordinary shares will be listed on the New York Curb Exchange.

Dow Directors

Stockholders of the Dow Chemical Co., at the annual meeting June 25 elected E. O. Barstow and C. J. Strosacker directors to succeed the late Dr. Herbert H. Dow and Mrs. Herbert H. Dow, resigned. Other directors were re-elected as were the officers. E. W. Bennett was elected an additional vice-president.

Dividends and Dates

	Stocks on records	Dividend	Payable
Abbott Lab., Inc.	June 18	62½	July
Air Reduction	June 30	.75	July 15
Allied Chem. & Dye pf	June 11	$1.75	July 1
Amer. S. & R. 2nd pf.	Aug. 7	$1.50	Sept. 1
Amer. S. & R. pf.	Aug. 7	$1.75	Sept. 1
Amer. S. & R., com.	July 10	.50	Aug. 1
Chile Copper	June 5	.37½	June 29
Colg.-Palm-Peet, pf.	June 10	$1.50	July 1
Com. Solvents com.	June 10	.25	June 30
Devoe & Ray. 1st pf.	June 20	$1.75	July 1
Devoe & Ray. 2nd pf.	June 20	$1.75	July 1
Devoe & Ray. com A.	June 20	.15	July 1
Devoe & Ray. com B.	June 20	.15	July 1
Eastman Kod. com.	June 5	$1.25	July 1
Eastman Kod. pf.	June 5	$1.50	July 1
Eastman Kod. com.	June 5	.75	July 1
Gliden Co. pr fr.	June 18	$1.75	July 1
Hercules Powder com.	June 12	.75	June 25
Industrial Rayon	June 22	$1.00	July 1
Intl. Salt com.	June 15	.75	July 1
Math. Alkali com	June 12	.50	July 1
Mathieson Alkali com.	June 12	.50	July 1
Mathieson Alkali pf.	June 12	$1.75	July 1
Munroe Chem. pf.	June 15	.87½	July 1
Monsanto C. Wks.	June 10	.31¼	July 1
National Lead com.	June 12	$1.25	June 30
Proctor & G. 8% pf.	June 25	$2.00	July 15
St. Joseph Lead	June 9	.25	June 20
St. Joseph Lead	Sept. 10	.25	Sept. 21
Shaw W & P com.	June 15	.62½	July 10
Spencer Kellogg	June 15	.20	June 30
Union C & C	June 2	.65	July 1
United Dye Wood	June 12	$.175	July 1
U. S. Gypsum com.	June 15	.40	June 30
Vulcan Detin'g com.	July 7	$1.00	July 20
Vulcan Detin'g pf.	July 7	$1.75	July 20
Will & Baumer com.	Aug. 1	.10	Aug. 15
Will & Buamer pf.	June 15	$2.00	July 1
Equipment			
Babcock & Wilcox Co.	June 30	$1.75	July 1
Foster Wheeler com.	June 12	.50	July 1
Foster Wheeler pf.	June 12	$1.75	July 1
General American Tank Car	June 13	$1.00	July 1
Ingersall Rand	June 8	$3.00	July 1
Int. Nickel of Canada com.	June 1	.15	June 30
Int. Nickel of Can. pf.	July 2	$1.75	Aug. 1
Link Belt com.	Aug. 15	.50	Sept. 1
Link Belt pf.	June 15	$1 62½	July 1

Rights

	Books Close	Privilege Expires
Aluminum Ltd.	Dec. 15	July 2
Monsanto C. Wks.	June 22	July 20

Dividends

Cleveland Cliffs Iron Co. took no action on the common dividend due at this time. The last common dividend was paid on March 25 at rate of $1 annually, previous to which stock had been on $4 annual basis. The regular quarterly dividend of $1.25 on preferred was declared, payable June 15 to stock of record June 5.

Directors of Cliffs Corp., holding company for Cleveland Cliffs Iron, took no action on the common dividend. Last quarter Cliffs Corp. dividend was 25 cents and on December 20 a 65-cent quarterly dividend was paid previous to which stock was on a $4 annual basis.

Corn Products Extra

Corn Products Refining Co. has declared an extra dividend of 50 cents on the common stock in addition to the regular quarterly dividends of 75 cents on the common and $1.75 on the preferred stock. Both dividends on the common stock are payable July 20 to stock of record July 3 and the preferred dividend is payable July 15 to stock of record July 3.

Nichols Copper Co. has declared the regular quarterly dividend of 25 cents on both Class A and Class B stocks, payable July 1 to stock of record June 30.

Hercules Powder Co. has declared the regular quarterly dividend of $1.75 on the preferred stock, payable August 15 to stock of record August 4.

New Jersey Zinc Co. has declared the regular quarterly dividend of 50 cents, payable August 10 to stock of record July 20.

U. S. Industrial Alcohol Co. has omitted the quarterly dividend on the common stock due at this time. On May 1, 1931, the quarterly dividend was reduced to 50 cents from $1.50.

Anaconda Copper Mining Co. has declared the regular quarterly dividend of 37½ cents, payable August 17 to stock of record July 11.

Westinghouse Electric & Manufacturing Co. has declared the regular quarterly dividends of $1 each on common and preferred stocks.

Both dividends are payable July 31 to stock of record July 6.

McK & R Buys Bonds

As a result of purchases made in the open market, all at a substantial discount, McKesson & Robbins, Inc., has acquired sufficient of its outstanding 5½% debentures to cover not only the sinking fund requirements due July 15, 1931, but also the sinking fund requirements of January 15, 1932, calling together for the expenditure of $500,000. Acquisition of these bonds results in considerable saving to the company. A total of $22,000,000 of the 5½% bonds was originally offered to investors last year.

By the process of liquidating its inventories, the United Carbon Co. has been reducing its bank loans, of which there were $1,000,000 outstanding at the end of March this year.

Monsanto Rights

New York Stock Exchange has received notice from Monsanto Chemical Works that holders of capital stock of record June 22 will be offered right to subscribe at $25 a share for capital stock, no par, to the extent of one share for each 20 shares held, the committee on securities rules the stock be quoted ex-rights on June 22 and that rights may be admitted to dealings on that date. Rights must be settled on July 2 and will expire on July 20.

Earnings Abroad

A detailed survey of the financial reports from the leading foreign producers of industrial chemicals reveals the fact that a high rate of dividends has been maintained in most instances despite lower earnings and that the loss in revenue has been offset to a large degree by plant reorganizations, initiating lower operating costs, by reducing general overhead and by the exploitation of specialties.

The survey (June 22) was prepared by T. W. Delahanty, assistant chief of the Chemical Division of the Department of Commerce dealt with the larger companies only as information was more readily available about these and also in many instances the leading companies in many countries of Europe constitute a major part of the entire chemical structure of the country. The following abstracts are of particular interest.

Germany

Although net profits on operations of the Dye Trust amounted to only 89,218,000 marks in 1930, as compared with 104,598,000 in 1929 and 118,458,000 in 1928, the annual dividend of 12 per cent again was granted to common shareholders in 1930. This maintenance of dividends despite declining net earnings was made possible by a reduction in the dividend-paying capital of the organization. It is probable that this capital reduction to around 700,000,000 marks will be unchanged since announced stock issues have been withheld. The I. G. has reserves of about 200,000,000 marks and almost 250,000,000 marks in exchange convertible bonds of the 1928 series.

The I. G. Chemie Basle, operating in Switzerland, was independently able to pay a 12 per cent dividend on share capital of 15,400,000 francs. The American I. G. Chemical Corporation reported a net profit of $3,969,066 on operations during 1930, and, although dividends were not declared, earnings were deposited to earned surplus account.

Italy

The Montecatini, leading chemical concern in Italy, after paying interest on an American loan and writing off 12,350,000 lire for plant amortizations, closed the year 1930 with a net profit of 82,963,755 lire, or about 15 per cent less than 1929 profits. A dividend of 15 lire per par share was declared in 1930, compared with 18 lire in 1928 and 1929, representing, however, only a 7 per cent return on the market value of the stock. The Montecatini group, having a paid-in capital of half a billion lire, controls 30 subsidiary companies in Italy producing a range of products.

The annual report of the Montecatini calls attention to the material decline in consumption of chemical fertilizers in

And Now, When The Cupboard Is Full

—N. Y. Herald Tribune

Italy during 1930, attributed largely to depressed agricultural conditions and low prices. During the year the company nevertheless increased superphosphate production 13 per cent by putting into operation three new superphosphate plants at Salerno, Catiana, and Brindisi, in accordance with the plan of the Montecatini to manufacture in the leading consuming districts and avoid long freight hauls.

France

The chemical industry of France demonstrated fairly normal activity during the first half of 1930, but about the middle of the year restricted buying in the domestic market became apparent and consumption showed a steady decline to the close of the year. During 1929 considerable progress in plant development and organization was made, but further development plans, in general, were placed in abeyance in 1930 pending a return to more normal conditions. Production economies became necessary and financial reorganizations and greater amalgamation resulted.

Among the principal French chemical companies there were five important capital increases during 1930, totaling 200,000,000 francs, as compared with eight such increases during 1929. The St. Gobain was authorized in 1929 to increase its capital from 225,000,000 to 450,000,000 francs, of which only 85,000,000 francs were subscribed during 1930. The Bordelaise des Produits Chimiques increased its share capital from 50,000,000 to 70,000,000 francs during the year; Auby, from 27,500,000 to 55,000,000 francs Kali Ste. Therese, from 40,000,000 to 80,000,000 francs; and the Electro Chimie and Electro Metallurgie d'Ugine, from 88,000,000 to 120,000,000 francs. A further authorization to increase Ugine stock shares another 60,000,000 francs has not been taken advantage of as yet. One large new firm was organized in 1930 by the Kali Ste. Therese and the Mines Domaniales de Potasse. This concern, the Société Potasse et Engrais Chimiques, was formed to manufacture fertilizers having a high potash content

Some further movement in amalgamation was noted in 1930, although not as marked as in 1929. The Kuhlmann Co. subscribed to the entire 20,000,000-franc capital increase of the Compagnie Bordelaise des Produits Chimiques, thus increasing Kuhlmann's importance in the superphosphate field. Another important development was the absorption of the Usines Dior by the Phosphates Tunisiens.

Outstanding during the year was the voting of a credit of 90,000,000 francs to be used for the construction of a new nitric-acid plant at the Government establishment in Toulouse. The Kuhlmann Co. decided upon a bond issue of 150,000,000 francs during the year. Although relatively few financial reports have been received from France at this writing, it might be noted that the dividend declared by the Matieres Colorantes et Produits Chimiques de St. Denis remained again at 50 francs per share as in 1929. Net profits reported during the year, amounting to 11,505,000 francs, exceed those recorded during 1929, given as 10,287,000.

Switzerland

The Society of Chemical Industry reported net earnings of 5,879,000 francs in 1930, compared with 6,024,000 in 1929. Dividends of 17 per cent again were declared in 1930 on the share capital of the company totaling 20,000,000 francs. No increase in capital was announced although new bonds amounting to 5,000,000 francs were floated for the purpose of enlarging the Basle plant and purchasing new equipment.

The 1930 report of the Sandoz Chemical Works indicates a falling off in dye sales, balanced to a degree by sales of pharmaceuticals, maintained largely as a result of the favorable foreign reception of certain new pharmaceutical specialties such as Calcium Sandoz, Allisatin, and Optalidon. Net profits of the Sandoz concern in 1930 were reported at 3,443,000 francs, as compared with 3,496,204 in 1929. Dividends were reduced to 20 per cent on the company's share capital of 10,000,000 francs, 25 per cent having been declared in every other year since 1925.

Union Chimique Belge

Net profits of this key Belgian firm were 66,623,000 Belgian francs ($1,865,000) in 1930, contrasted with 74,800,000 ($2,094,521) in 1929. Important amortization of funded debt took place during 1929 and 1930, and, consequently, no dividend was declared in 1930, the balance being carried as undivided profits.

Company Reports

Smelting Earnings Off Sharply

United States Smelting Refining & Mining Co. reports for five months ended May 31, 1931, estimated consolidated net income of $757,123 after interest, depreciation, depletion, amortization and federal taxes, equivalent after 7% preferred dividend requirements, to 8 cents a share (par $50) on 620,562 shares of common stock. This compares with $1,401,947, or $1.12 a share in corresponding period of previous year.

Consolidated income account for five months ended May 31, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Net aft int & tax	$1,516,559	$2,309,038	$2,713,378	$2,586,574
Depr. depl & amort	759,436	907,091	756,330	861,423
Net income	$757,123	$1,401,947	$1,957,048	$1,725,151
Pfd divs	709,260	709,260	709,260	709,260
Surplus	$47,863	$692,687	$1,247,788	$1,015,891

Company declared regular quarterly dividends of 25 cents on the common and 87½ cents on preferred, payable July 15, to stock of record July 2.

Company issued the following statement:

"The decreased earnings for the first five months of 1931 reflect the further decline in metal prices, which continued extremely low throughout the period. Earnings also have been affected by the lack of coal business, due to general business depression throughout the region served by the coal properties and the railroad.

"The strong cash and current asset situation which existed at the beginning of the year has been improved. At certain properties where there has been some curtailment of production, development work has been continued with good results. The company is in excellent condition to take advantage of any improvement in the general situation."

Wesson Oil Reports Favorably

Wesson Oil & Snowdrift Co., Inc., and subsidiaries for nine months ended May 31, 1931, show net profit of $1,984,042 after depreciation, federal taxes, etc., equivalent after dividend requirements on $4 convertible preferred stock, to $1.50 a share on 600,000 no-par shares of common stock. This compares with $2,237,531 or $1.73 a share in first nine months of previous fiscal year.

For quarter ended May 31, 1931, net profit was $614,071 after taxes and charges, equal to 43 cents a share on common, comparing with $662,658 or 50 cents a share in preceding quarter and $790,472 or 65 cents a share in May quarter of 1930.

The Abbott Laboratories for the first five months of this year had net profits of approximately $279,000 after charges and taxes compared with net profit of about $229,000 for the Abbott and Swan-Meyers Co. combined for the corresponding period last year.

Although sales for the period were about 4% lower than last year due to the exclusion of sales of the Canadian subsidiary economies resulting from carefully budgeted expenses.

Archer-Daniels-Midland Co. reports for nine months ended May 31, 1931, net profit of $560,458 after depreciation, federal taxes, etc., equivalent after dividend requirements on 7% preferred stock, to 65 cents a share on 549,546 no-par shares of common stock. This compares with $1,159,752 or $1.74 a share in the corresponding nine months of previous fiscal year.

For quarter ended May 31, 1931, net profit amounted to $102,638 after charges and taxes, equal to 6 cents a share on common, comparing with $104,229 or 7 cents a share in preceding quarter and $353,592 or 52 cents a share for quarter ended May 31, 1930.

Sun Oil Assets Show Gain

Sun Oil Co. and subsidiaries as of May 31, 1931, (adjusted to give effect to the sale of 3 year 5% gold notes) show total assets of $94,884,372 compared with $94,140,681 on December 31, 1930, and earned surplus $10,905,780, against $10,605,255. Current assets were $24,876,142 and current liabilities $7,517,252 as compared with $26,073,171 and $10,157,097, respectively, on December 31, 1930.

Consolidated balance sheet of Sun Oil Co. and subsidiaries (adjusted to give effect to the sale of 3-year 5% gold notes), as of May 31, 1931, compares with December 31, 1930, as follows:

Assets	*May 31, '31*	*Dec. 31, '30*
*Prop, plant, equipt & patents	$59,045,131	$58,698,717
Investments	8,717,605	7,633,874
Cash	1,338,759	1,348,600
Marketable securities	326,338	382,175
Notes and accounts receivable, etc	4,911,904	4,941,475
Due from employes	150,482	146,104
Oil inventories	14,962,225	14,267,596
Materials and supplies	3,186,434	4,987,222
Deferred charges	2,245,494	1,734,918
Total	$94,884,372	$94,140,681
Liabilities		
Preferred stock	$10,000,000	$10,000,000
†Common stock	52,019,745	52,015,944
Funded debt	12,264,500	8,398,000
Notes and accounts payable	5,706,406	8,912,475
Accrued liabilities	1,135,180	1,221,520
Other current liabilities	37,885	23,104
Accrued preferred dividends	50,000	50,000
Federal taxes	587,781	778,821
Reserves	2,168,755	2,127,243
Minority interest	8,340	8,319
Earned surplus	10,905,780	10,605,255
Total	$94,884,372	$94,140,681

*After depreciation. †Represented by 1,536,361 no-par shares.

American I. G. Net Up

Net earnings of the American I. G. Chemical Corporation for the fiscal year ended March 31, 1931, amounted to $2,322,952, according to the annual report which has been mailed to stockholders. This compares with $2,088,442 for the eleven months ended March 31, 1930, as reported in the first annual report of the corporation, which was organized on April 26, 1929. Total income for the fiscal year just ended amounted to $4,252,987 as against $3,786,562 for the previous period.

Net income after deducting all expenses and taxes but before debenture interest amounted to $3,969,066 compared with $3,556,771 last year. Interest on debentures amounted to $1,646,113 so that net income was about two and one-half times the requirements for payment of debenture interest.

Vulcan Earnings Hold

Vulcan Detinning Co. reports for quarter ended March 31, 1931, net profit of $79,264 after depreciation, taxes, etc., equivalent after allowing for dividend requirements on 19,709 shares of 7% preferred stock, to $1.38 a share on 32,258 shares of common stock. This compares with $78,747 or $1.37 a share on 32.258 common shares in preceding quarter and $110,445 or $2.21 a share on combined 20,000 shares of common and 12,258 shares of Class A common stocks after preferred dividend requirements in first quarter of previous year.

Income account for quarter ended March 31, 1931, compares as follows:

	1931	*1930*	*1929*	*1928*
Sales	$982,991	$1,538,370	$1,697,700	$1,247,339
Invent'y adjust	*25,007	†173,529	†143,239	†120,450
*Exp. depr. etc	914,417	1,230,935	1,369,007	1,078,549
Profit	$93,581	$133,906	$185,454	$48,385
Other inc	6,560	5,192	13,841	3,562
Total income	$100,141	$139,098	$199,295	$51,947
Tax res, etc	20,877	28,653	34,732	9,435
Net profit	$79,264	$110,445	$164,563	$42,512
Dividends	66,748	....	....	....
Surplus	$12,516	....	....	....

*Credit. †Debit.

The Industry's Stocks

NEW YORK STOCK EXCHANGE

1931 June High	1931 June Low	1931 June Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
90	70¾	84⅞	109⅜	70¾	156⅞	87½	195,200	980,000	Air Reduction	No	830,000	$3.00	6.32	7.75
133¼	102¾	128¾	182¾	102¾	343	170¼	309,500	1,557,085	Allied Chem. & Dye	No	2,401,000	6.00		12.60
124	121⅞	124	126	120¾	126¼	120¾	1,100	8,400	7% cum. pfd.	100	393,000	7.00		76.88
19	11½	18	29¾	11½	10⅜	1⅝	6,700	42,600	Amer. Agric. Chem.	100	333,000		Yr. Je. '30 Nil	
9¼	6⅝	9	14½	5⅞	33	9	25,800	149,000	Amer. Com. Alc.	No	389,000		—	3.22
16¼	8⅛	13½	23¾	8⅛	51½	7	18,900	77,600	Amer. Metal Co., Ltd.	No	1,218,000	1.00		3.23
53½	53½	53½	89½	53½	116	80	300	1,100	conv. 6% cum. pfd.	100	68,000	6.00		47.53
40¾	24⅜	36⅞	58½	24⅜	79½	37½	124,000	613,495	Amer. Smelt. & Refin.	No	1,830,000	4.00		10.02
119	118⅛	118¼	138½	117½	141	131	1,200	10,300	7% cum. pfd.	100	500,000	7.00		43.66
2	1⅛	2	4½	1⅛	22½	2	8,300	15,300	Amer. Solvents & Chem.	No	503,000			2.56
6¾	3¾	6	8¾	3⅜	17⅞	3⅜	9,500	21,200	Amer. Zinc. Lead, & Smelt.	25	200,000			0.53
40	27	40	40	26¾	79⅞	26¾	1,800	10,600	6% cum. pfd.	25	80,000			7.32
32¾	18¾	28⅞	43¼	18¾	81½	25	975,400	3,311,425	Anaconda Copper Mining	50	8,859,000	2.50		8.29
11½	8⅛	10⅝	18	8	29¼	13⅛	12,800	77,900	Archer Dan. Midland	No	550,000	2.00	Yr. Aug. '30 1.68	
17⅞	11⅛	15¼	23⅝	11⅛	51⅜	16⅝	88,300	563,700	Atlantic Refining Co.	25	2,690,000	1.00	1.02	6.20
38	30	37	54	30	106	42	3,600	27,500	Atlas Powder Co.	No	265,000	4.00	2.67	7.66
90	85	86	99⅞	85	106	97	510	2,640	6% cum. pfd.	100	96,000	6.00		28.25
1	¾	⅞	2	¾	5¼	⅞	1,600	15,700	Butte & Sup. Mining	10	290,000			Nil
2½	1⅛	2½	2½	1⅛	4¼	1¼	8,600	30,900	Butte Copper & Zinc	5	600,000			0.34
6	3½	6	7¼	2¼	15⅞	2	7,100	59,800	Certain-Teed Products	No	400,000			Nil
...	...	...	25⅛	8¼	45⅛	6¾		2,739	7% cum. pfd.	100	63,000			Nil
47	40	45¼	50½	40	64⅞	44	8,100	60,800	Colgate-Palmolive-Peet	No	2,000,000	2.50	3.76	4.03
84	55	79¼	111⅝	55	199	65⅛	73,600	406,120	Columbian Carbon	No	499,000	5.00		7.84
16¾	10¾	14½	21½	10¾	38	14	207,500	1,432,600	Comm. Solvents	No	2,530,000	1.00	1.07	1.51
74½	55⅝	74	86⅝	55⅝	111⅜	65	89,700	450,100	Corn Products	25	2,530,000	3.00		5.49
151	150⅜	151	152¼	146⅞	151½	140	570	890	7% cum. pfd.	100	250,000	7.00		62.59
14⅞	9⅝	13	23	9⅝	43⅜	10	41,900	243,200	Davison Chem. Co.	No	504,000		Yr. Je. '30 4.00	
15	11	14¼	19⅛	11	42¾	11½	6,200	18,600	Devoe & Raynolds "A"	No	160,000	1.20	2.24	4.52
100	100	100	109	100	114¾	99	100	420	7% cum. 1st pfd.	100	16,000	7.00		67.59
92⅜	71	89½	107	71	145¼	80½	645,700	2,502,800	DuPont de Nemours	20	11,014,000	4.00	4.64	6.99
122¾	120	122¾	124	118¾	123	114½	3,500	18,700	6% cum. deb.	100	978,000	6.00		78.54
156½	118	148	185¾	118	255¼	142⅛	162,000	879,605	Eastman Kodak	No	2,261,000	5.00		9.57
133⅞	126	...	134¼	126	134	120⅞	30	1,100	6% cum. pfd.	100	62,000	6.00		356.89
30	22	28	43¼	22	55½	24½	60,300	646,300	Freeport Texas Co.	No	730,000	4.00		5.60
26⅞	15¼	23⅝	47	15¼	71⅛	22⅜	82,200	448,300	General Asphalt Co.	No	413,000	3.00		4.71
11	7¾	10¼	16⅛	7¾	38	7	15,500	155,871	Glidden Co.	No	695,000		Yr. Oct. '30 Nil	
67½	63	66	78	60	105⅛	63½	770	4,660	7% cum. prior pref.	100	74,000	7.00	Yr. Oct. '30 Nil	
46	43	45	58	40	85	50	700	7,600	Hercules Powder Co.	No	603,000	3.00	2.91	5.95
112	111	112	119½	111	123¾	116½	330	1,990	7% cum. pfd.	100	114,000	7.00		38.16
36⅞	21½	32⅝	86	21½	124	31	44,200	287,300	Industrial Rayon	No	200,000	4.00		7.26
2¼	1⅝	2⅛	5¼	1⅝	8½	3⅜	1,500	30,300	Intern. Agric.	No	450,000		Yr. Je. '30 1.68	
19	16½	19	51⅛	16½	67¼	42¼	2,500	11,300	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30 14.58	
16½	9½	15½	20⅛	9½	44⅜	12¾	844,900	3,972,400	Intern. Nickel	No	14,584,000	1.00		1.47
37	29¼	34½	42	29¼	45¾	31	17,300	333,200	Intern. Salt	No	240,000	3.00		11.32
61	42⅛	58	80¾	40⅝	148⅜	48¾	449,600	2,003,100	Johns-Manville Corp.	No	750,000	3.00		8.09
15	11¼	15	16½	10	25	8¾	1,600	11,100	Kellogg (Spencer)	No	598,000	0.80		2.36
35⅜	20⅛	31½	55⅛	20⅛	81⅞	39	34,000	176,800	Liquid Carbonic Corp.	No	342,000	4.00	Yr. Sep. '30 5.22	
11¾	7⅛	10⅜	17	7⅛	37⅜	10½	178,900	199,500	McKesson & Robbins	No	1,073,000	1.00		2.65
31¼	20	29¾	37¼	20	49¼	25¾	8,500	29,100	conv. 7% cum. pref.	50	428,180	3.50		9.43
20	16	20	25	16	39¾	20	2,300	9,900	MacAndrews & Forbes	No	340,000	2.60		3.13
23⅞	22	17⅝	31½	17⅝	51⅜	30¼	27,500	355,765	Mathieson Alkali	No	650,000	2.00	2.96	3.31
114	114	114	125⅜	112	136	115	50	570	7% cum. pfd.	100	28,000	7.00		93.91
24½	18⅝	23	26½	18½	63¾	18⅜	9,000	39,000	Monsanto Chem.	No	416,000	1.25	1.80	4.25
28⅞	22	27¾	36⅜	19¾	39½	18⅛	26,600	270,600	National Dist. Prod.	No	252,000	2.00		1.42
126¾	85	122	132	85	189½	114	23,500	60,700	National Lead	100	310,000	5.00		25.49
143	140	143	143	135⅝	144	135	490	3,840	7% cum. "A" pfd.	100	244,000	7.00		41.95
119	118	119	119⅞	118	120	116	630	3,830	6% cum. "B" pfd.	100	103,000	6.00		82.47
42	41	42	53	41	85	30	400	4,400	Newport $3 cum. conv. "A"	50	33,000	3.00		29.79
37¼	28½	36	46½	28½	55⅜	26⅛	24,200	218,300	Penick & Ford	No	425,000	1.00		3.97
65¾	56	64¾	71¼	56	78⅞	52⅝	32,300	169,000	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30 3.36	
8⅞	5½	8⅜	11⅞	5½	27¼	7⅜	57,200	310,000	Pure Oil Co.	25	3,038,000			1.52
75¾	69½	75	101⅞	67	114¼	90½	550	7,070	8% cum. pfd.	100	130,000	8.00		22.55
33¼	24⅞	31¾	42⅝	24⅞	56½	36⅞	65,000	259,000	Royal Dutch, N. Y. shs.		894,000			3.35
21½	14¼	19½	17¼	14½	57¼	19¼	63,500	283,400	St. Joseph Lead	10	1,951,000	2.00	2.09	3.82
8	4½	7¾	10¼	4½	25½	5¼	101,250	579,590	Shell Union Oil	No	13,071,000			1.26
39¾	31⅛	37⅞	51¾	31⅛	75	42¼	213,500	728,300	Standard Oil, Calif.	No	12,846,000	2.50		3.63
41⅞	30⅝	38¾	52½	30⅝	84⅞	43½	527,425	2,505,725	Standard Oil, N. J.	25	25,419,000	1.00		4.76
18¾	13⅞	17⅞	26	13⅞	40⅜	19¾	609,600	1,438,555	Standard Oil, N. Y.	25	17,809,000	1.60		2.23
7¾	5⅛	7	9½	5⅛	17	7¾	6,900	45,500	Tenn. Corporation	No	857,000	1.00		2.19
24⅞	18	23	36¼	18	60½	28¼	189,900	1,330,600	Texas Corp.	25	9,851,000	3.00		4.91
39¼	29⅛	37⅝	55¾	29⅛	67⅜	40¼	120,600	1,002,600	Texas Gulf Sulphur	No	2,540,000	4.00	5.50	6.40
55⅜	43½	52¾	72	43½	106⅜	52½	453,275	2,543,475	Union Carbide & Carb.	No	9,001,000	2.60		3.94
19¼	13	16⅞	28¾	13	84	14⅜	19,100	402,100	United Carbon Co.	No	398,000		1.43	1.94
33½	24⅜	30	77⅜	24⅜	139⅜	50½	57,500	664,450	U. S. Ind. Alc. Co.	No	374,000	6.00	—	12.63
38¾	23⅛	35	76¾	23⅛	143¼	44⅜	712,900	6,737,800	Vanadium Corp. of Amer.	No	378,000	3.00		4.91
1⅞	1	1⅜	3¼	1	8⅞	1⅝	3,600	12,700	Virginia Caro. Chem.	No	487,000		Yr. Je. '30 Nil	
12¾	7⅛	12	17	7⅛	34¼	9	2,300	14,600	6% cum. part. pfd.	100	213,000		Yr. Je. '30 2.63	
61¾	59¼	61½	72	59¼	82⅜	67½	900	5,100	7% cum. prior pfd.	100	145,000	7.00	Yr. Je. '30 11.96	
27	18	26½	40	18	59½	18	7,900	56,550	Westvaco Chlorine Prod.	No		2.00	2.51	4.32

NEW YORK CURB

1931 June High	1931 June Low	1931 June Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	Earnings $-per share-$ 1929
5	5	5	5¾	4⅞	13	3⅜	200	2,500	Acetol Prod. conv. "A"	No	60,000			0.42
10	7	9½	19½	5	34	16	500	85,425	Agfa Ansco Corp.	No	300,000			Nil
146	90	137	224	90	356	140½	23,343	108,143	Aluminum Amer.	No	1,473,000			11.18
100	95	98	109⅝	89	111½	104	2,350	17,200	6% cum. pfd.	100	1,473,000	6.00		17.19
75	45	75	102	40½	232	57½	300	10,500	Aluminum Ltd.	No	573,000			4.15
9⅜	6⅛	8¼	12¾	6⅛	37	6⅝	61,600	427,900	Amer. Cyanamid "B"	No	2,404,000			4.15
8¼	5⅛	8¼	15	5⅛	43⅜	7½	4,400	50,000	Anglo-Chilean Nitrate	No	1,757,000		Yr. Je. '30 Nil	
3	2¼	...	4	⅜	6½	½	600	19,706	Assoc. Rayon Corp.	No	1,200,000		Yr. Je. '30 1.87	
...	...	...	60	32¼	60⅜	31¼		47,300	conv. 6% cum. pfd.	100	200,000	6.00		

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1930	1929
1⅜	1¼	1⅜	1⅞	⅞	5¼	1⅛	800	20,600	Brit. Celanese Am. Rcts	2.43	2,806,000			0.03
...	...	...	59	45½	90	48		2,000	7% cum. part. 1st pfd	100	148,000	7.00		14.50
75	70¼	72	80	68¼	90	70	825	2,080	7% cum. prior pfd	100	115,000	7.00		25.70
...	...	...	...	...	20	3½		6,440	Celluloid Corp	No	195,000			1.76
...	...	...	...	...	103	90¼			7% cum. 1st part. pfd.	No	24,000	7.00		8.59
...	...	...	9	7¼	13¼	8⅜		3,700	Courtaulds, Ltd	1£				0.34
43	34	...	51	34	100	49	2,500	10,200	Dow Chemical	No	630,000	2.00		4.08
62	38	60⅞	75½	38	166⅞	58½	36,900	161,300	Gulf Oil	25	4,525,000	1.50		9.83
9½	9	9¼	13	9	23	10½	300	2,400	Heyden Chemical Corp	10	150,000			3.08
3⅛	3⅛	3⅛	...	...	7	4	700	2,300	Imperial Chem. Ind	1£				0.49
...	...	...	...	...	16	3½		100	Monroe Chem	No	126,000			2.54
40½	36	...	60	36	79½	45	1,200	4,200	Shawinigan W. & P.	No	2,178,000	2.50		2.35
59	58	59	66⅛	58	85	58	200	6,150	Sherwin-Williams Co.	25	636,000	4.00	Yr. Aug. '30 4.14	
6	4	5½	12	3⅞	34½	3⅝	4,500	27,300	Silica Gel Corp	No	600,000			
28½	19⅛	27⅝	38½	19⅛	59⅞	30	215,600	910,500	Standard Oil Ind	25	16,851,000	2.50		4.66
26⅞	24⅛	26¼	30⅜	24⅛	34½	27	8,000	42,700	Swift & Co	25	6,000,000	2.00		2.18
7	4	7	16	3⅝	22¾	3	4,800	137,250	Tubize "B"	No	600,000	10.00		
...	...	...	13	10				16,500	United Chemicals					
20⅞	16	...	28⅞	14	44	14	2,500	21,200	$3 cum. part. pfd.	No	115,000	3.00		7.66

CLEVELAND

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings 1930	1929
76¾	76	76	94	76	96	91½	150	1,460	Cleve-Cliffs Iron, $5 pfd	No	498,000	5.00	11.42	
61½	53¾	61½	68½	53¾	85	57½	2,353	13,042	Sherwin-Williams Co	25	636,000	4.00	Yr. Aug. '30 4.14	

CHICAGO

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings 1930	1929
39	35	39	39⅞	35	46¾	33½	1,500	6,550	Abbott Labs	No	145,000	2.50	3.32	4.92
5	4¾	5	5½	4¾	15	3½	50	2,610	Monroe Chem	No	126,000			2.54
28	26½	26½	33	21	35	15½	120	1,600	$3.50 cum. pref	No	30,000	3.50		13.35
27	25¼	26⅜	30½	24½	33¼	27	23,850		Swift & Co	25	6,000,000	2.00		2.18

CINCINNATI

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings 1930	1929
63	56	...	71	56	110	53½	4,937	18,296	Procter & Gamble	No	6,410,000	2.40	Yr. Je. '30 3.36	

PHILADELPHIA

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUES	Par $	Shares Listed	An. Rate	Earnings 1930	1929
60¼	60¼	60¼	81¼	58	100	89	100	1,900	Pennsylvania Salt	50	150,000	5.00	Yr. Je. '30 7.97	

The Industry's Bonds

NEW YORK STOCK EXCHANGE

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUE	Date Due	Int. %	Int. Period	Outstanding $
104	103	103	105⅛	102¾	105½	102	173	524	Amer. Agric. Chem., 1st ref. s. f. 7½s	1941	7½	F. A.	7,667,000
88	83¾	83¾	99	83¾	100½	93	41	199	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
100	96½	100	102	96¾	177	94⅜	513	1,955	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
102⅞	101½	102¼	104½	101½	104	101	286	2,639	Am. Smelt & Ref. 1st. 5s. "A"	1947	5	A. O.	36,578,000
63	57	62¾	47	57	98½	67	57	511	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
102¼	100½	100½	103	100½	103	100	197	1,026	Atlantic Refin. deb. 5s	1937	5	J. J.	14,000,000
100	97¼	97¼	104	97¼	105½	100¼	17	524	Interlake Iron Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
105	105	105	105	102	104½	97½	12	79	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822,000
52	34	51	75½	34	87½	38	442	3,440	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
83	75	83	96	75	100½	87	129	958	Pure Oil s. f. 5½% notes	1937	5½	F. A.	17,500,000
97	94⅛	96⅝	103	88	104	93¾	90	565	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
103¾	102⅞	103¼	105½	102	104¾	100	780	3,927	Standard Oil, N. J. deb. 5s	1946	5	F. A.	120,000,000
99¾	97¾	98½	106½	97¾	104⅛	96½	385	3,173	Standard Oil, N. Y. deb. 4½s	1951	4½	J. D.	50,000,000
89	88½	...	99	88½	102½	90¼	14	176	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000

NEW YORK CURB

1931 June High	1931 June Low	Last	1931 High	1931 Low	1930 High	1930 Low	Sales In June	Sales During 1931	ISSUE	Date Due	Int. %	Int. Period	Outstanding $
105⅜	103½	104½	105½	102¾	104⅞	100⅛	296,000	1,315,000	Aluminum Co., s. f. deb. 5s	1952	5	M. S.	37,115,000
96½	94	...	104¾	94	104¼	96⅜	119,030	780,000	Aluminum Ltd., 5s	1948	5	J. J.	20,000,000
...	...	...	56	47⅛	60	51			Amer. Solv. & Chem. 6½s	1936	6½	M. S.	1,737,000
...	...	...	38	26	...	...			General Ind. Alc., 6½s	1944	6½	M. N.	2,351,000
45	43	...	53	43	80	51	36,000	321,000	General Rayon 6s. "A"	1948	6	J. D.	5,085,000
101⅞	100	100¾	103	100	104	90¼	378,000	5,814,000	Gulf Oil, 5s	1937	5	J. D.	30,414,000
101½	100	...	104	100	104	99	278,000	1,426,000	Sinking Fund deb. 5s	1947	5	F. A.	35,000,000
100⅞	96	98¾	102⅞	99¼	103½	95¾	106,000	1,077,000	Koppers G. & C. deb. 5s	1947	5	J. D.	23,050,000
98	96¾	97¼	98⅜	92⅝	98¾	90⅜	231,000	2,006,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
98½	96	...	98½	96	98¾	90¾	28,000	569,000	4½s., series "B"	1968	4½	M. N.	16,108,000
...	...	...	94	86½	107	96			Silica Gel Corp. 6½s	1932	6½	A. O.	1,700,000
104	103	...	104	102	103½	79½	106,000	507,000	Swift & Co., 5s	1944	5	J. J.	22,916,000
103	102¾	...	104⅛	101	103½	100½	14,000	153,000	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

The Trend of Prices

Important Price Changes

Advances	June	May
Egg Yolk Granular	$ 0.48	$ 0.43
Sodium Stannate	.20½	.19½
Tin Crystals	.25	.24
Tetrachloride	.18¼	.17¼
Declines		
Acid Citric, Crystals	.36	.37
Ammonium Sulfate (dom.)	32.00	33.00
Copper Sulfate	3.70	3.90
Cream of Tartar (dom.)	.22¾	.23¾
Glycerine C. P.	.11½	.12
Ether U. S. P. (conc.)	.09	.10
Methanol, pure	.35½	.37½
Quicksilver	96.00	101.00
Wax Carnauba No. 1	.36	.37

Declines continued to dominate the chemical market. While several items showed a firmer tone, several weak spots continued to give the market a generally downward trend. Particular improvement was in evidence in the case of the metals, specially tin, zinc and lead. While copper appeared stronger during the greater part of the month, it weakened again slightly towards the close. The tin salts were all up as a result of the upward swing in tin straits. A particularly strong spot was found in the various grades of egg yolk.

On the other side of the ledger, two outstanding declines were registered, in copper sulfate which went to a new low and synthetic methanol. Both of these chemicals were also reduced last month and this further reduction forced the CHEMICAL MARKETS Average Price for twenty representative chemicals into new low ground. Actual sales of copper sulfate were reported as being satisfactory, but with the metal touching 8 cents a further scaling down was affected by producers. Glycerine continues to be a particularly soft spot in the price structure and practically all grades were reduced. With the foreign mercury cartel lowering prices in an effort to stimulate sales the market in this country dropped to $96.00 a flask. All fertilizer materials were materially lowered in an effort to move accumulating stocks, but without much effect. Other important price declines occurred in citric acid and cream of tartar.

Shipments were lower in June, generally speaking, than in May, reflecting the usual summer curtailment of manufacturing activity. Both the textile and the tanning industries tapered off their schedules. The soap industry, however was expanding its operations. Paints and lacquers were not moving at the rate anticipated with the result that manufacturers were revising production schedules slightly.

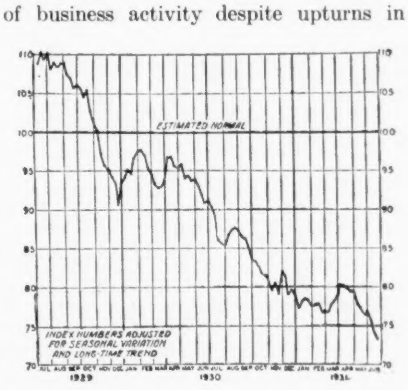
The gums as a class moved down and most of the waxes reacted from the higher prices reached in April. The naval stores industry did not take full advantage of the improved sentiment prevailing in most of the primary markets and prices were generally lower for most grades of rosin, while turpentine was off sharply. Stocks continue to pile up, preventing any improvement being initiated.

General Business

Of course the pronouncement of President Hoover on the debt moratorium stood out like a beacon light in the business news of the month. What may very likely prove to be the turning point was as welcome as it was unexpected. Business leaders have been floundering in a sea of pessimism. Wall Street has looked upon but one side of the situation for almost a year. Within a few hours sentiment changed to one of enthusiasm and a saner and more constructive feeling now prevails.

One of the most encouraging signs aside from the President's message, has been the stiffening in the commodity markets. For the past few weeks such commodity indexes as the Journal of Commerce and The National Fertilizer Association have ceased to show week to week reductions and although the movement in the opposite direction has been slight, it has been sustained. President Hoover's debt suggestions, of course, had a great deal to do towards crystalizing this sentiment. In many quarters it is thought that the turn in prices for raw materials represents the turning point in the depression.

Turning from the near future to look at the present, both wholesale and retail trade have failed to register any appreciable gains. Where special effort is made to move goods at price concessions considerable quantities are absorbed, but otherwise sales are still very quiet. The automobile industry has slackened production and steel activity is reaching new low figures. The New York Times Index of business activity despite upturns in



freight car loadings and electric power production shows further decline for June.

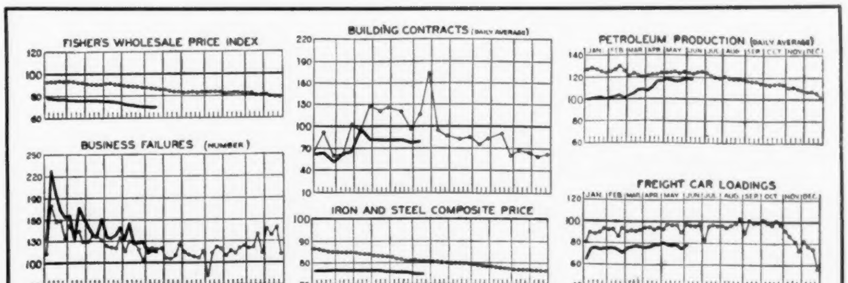
	June 20 1931	*June 13 1931*	*June 21 1930*
Freight car loadings	*72.9	72.3	91.2
Steel mill activity	43.1	47.7	87.5
Electric power prod.	82.5	82.1	93.5
Automobile prod.	64.2	71.0	89.0
Cotton cloth prod.	90.3	94.2	70.1
Combined index	*73.4	74.2	90.9

*Subject to revision

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, April	335,708	276,405	444,021
†Brokers Loans, June 27	$1,406	$1,419	$3,416
*Building Contracts, May	$306,079	$336,925	$457,416
*Car Loadings, June 27	732	760	926
†Commercial Paper, April	$307	$311	$553
Factory Payrolls, May	72.1	73.6	94.4
*Mail Order Sales, May	$50,070	$520,078	$59,350
Number of Failures Dun, May	$53,371	$50,868	$55,541
*Merchandise Imports, May	$182,000	$187,000	$284,644
*Merchandise Exports, May	$205,000	$217,000	$319,592
Furnaces in Blast %, June 1	33.4	36.0	56.6
*Steel Unfinished Orders, May 31	3,620	3,897	4,059

*000 omitted. †000,000 omitted.



Business indicators, Department of Commerce. The weekly average 1923-25 inclusive =100. The solid line represents 1931 and the dotted line 1930

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

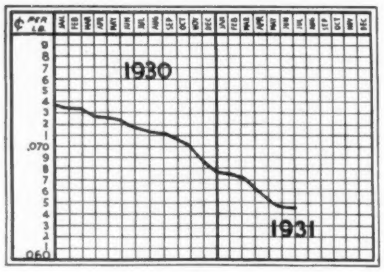
Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

Average Price Again Declines to New Low



Chemical Markets Average price for 20 representative industrial chemicals dropped to a new low due to further reductions in copper sulfate and synthetic methanol. The decline in May was also brought about by reductions in both of these chemicals. The average price stood at .0646 cents on June 27, against .0647 cents on May 30. The drop is the smallest that has occurred in the past sixteen consecutive months of lowering prices.

Acetone — Shipments against contract were reported to be in fairly good quantity for the early part of the summer, but spot sales in any volume were lacking. No change in the published quotations were made during the month.

Acid Acetic — Producers have not changed their schedules on this commodity now for several months. Demand from the textile centers is off from the high peak of a few months ago and some accumulations of stocks have resulted. While rumors of lower prices on large tonnages were in the market they could not be confirmed. It is unlikely that any change will be made for some time with lime selling at its present price.

Acid Citric — Competitive conditions between domestic and imported are said to be the cause of a further reduction of this commodity to 36 cents in bbls. (June 9) for crystals and granular. As this is the busy season the reduction was rather unexpected. Some improvement naturally followed the heat wave specially in the central sections. Figures released by the Camera Agrumaria at Messina show that stocks on hand of citrate of lime on March

	Current			1931		1930		1929
	Market		Low	High	High	Low	High	Low
Acetaldehyde, dr s lc-1 wks...lb.	.18½	.21	.18½	.21	.21	.18½	.21	.18½
Acetaldol, 50 gal dr..........lb.	.27	.31	.27	.31	.31	.27	.31	.27
Acetamide.................lb.	.95	1.35	.95	1.35	1.35	1.20		
Acetanilid, tech, 150 lb bbl...lb.	.20	.23	.20	.23	.23	.21	.24	.21
Acetic Anhydride, 92-95%, 100 lb cbys..................lb.	.21	.25	.21	.25	.29	.25	.35	.28
Acetin, tech drums..........lb.	.30	.32	.30	.32	.32	.30	.32	.30
Acetone, tanks,.............lb.	.10	.10½	.10	.10½	.12	.11	.16	.11
Acetone Oil, bbls NY.......gal.	1.15	1.25	1.15	1.25	1.25	1.15	1.25	1.15
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.68	.55	.68	.45
Acetylene Tetrachloride (see tetrachlorethane).............								
Acids								
Acid Abietic..................	.12	.12	.12	.12	.....	.....	.....	.....
Acetic, 28% 400 lb bbls c-1 wks.............100 lb.	.....	2.60	.....	2.60	3.88	2.60	3.88	3.88
Glacial, bbl c-1 wk.....100 lb.	.....	9.23	.....	9.23	13.68	9.23	13.68	13.68
Glacial, tanks...............	.....	8.98	.....	8.98	13.43	8.98		
Adipic....................	.72	.72	.72	.72	.....	.....	.....	.....
Anthranilic, refd, bbls........lb.	.85	.95	.85	.95	1.00	.85	1.00	.98
Technical, bbls............lb.	.65	.70	.65	.80	.80	.75	.80	.80
Battery, cbys...........100 lb.	1.60	2.25	1.60	2.25	2.25	1.60	2.25	1.60
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.40	.45	.53	.40	.60	.51
Boric, crys. powd, 250 lb. bbls..................lb.	.06½	.07	.06½	.07¾	.07¾	.06¾	.07¾	.05¾
Broenner's, bbls.............lb.	1.20	1.25	1.20	1.25	1.25	1.20	1.25	1.25
Butyric, 100% basis cbys.....lb.	.80	.85	.80	.85	.90	.80	.90	.85
Camphoric..................lb.	.....	5.25	.....	5.25	5.25	5.25	5.25	4.85
Chlorosulfonic, 1500 lb drums wks....................lb.	.04½	.05½	.04½	.05½	.05½	.04½	.05½	.04½
Chromic, 99¾%, drs.........lb.	.14½	.16	.14½	.17	.19	.15	.23	.17½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.06	1.00	1.06	1.00
Citric, USP, crystals, 230 lb. bbls...................lb.	.....	.36	.36	.43	.59	.40	.70	.46
Cleve's, 250 lb bbls..........lb.	.52	.54	.52	.54	.54	.52	.59	.52
Cresylic, 95%, dark drs NY..gal.	.47	.60	.47	.60	.70	.54	.54	.60
97-99%, pale drs NY.....gal.	.50	.60	.50	.60	.77	.58	.77	.72
Formic, tech 90%, 140 lb. cby...................lb.	.10½	.12	.10½	.12	.12	.10½	.12	.10½
Gallic, tech, bbls............lb.	.60	.70	.60	.70	.55	.50	.12	.50
USP, bbls.................lb.	.....	.74	.....	.74	.74	.74	.55	.74
Gamma, 225 lb bbls wks.....lb.	.77	.80	.77	.80	.80	.77	.80	.74
H, 225 lb bbls wks..........lb.	.65	.70	.65	.70	.70	.65	.99	.80
Hydriodic, USP, 10% soln cby lb.	.....	.67	.....	.67	.67	.67	.72	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.............lb.	.45	.48	.45	.48	.48	.45	.67 .48	.45
Hydrochloric, CP, see Acid Muriatic..................					.....	.....	.....	.....
Hydrocyanic, cylinders wks...lb.	.80	.90	.80	.90	.90	.80	.90	.80
Hydrofluoric, 30%, 400 lb bbls wks...................lb.	.....	.06	.....	.06	.06½	.06	.06	.06
Hydrofluosilicic, 35%, 400 lb bbls wks..............lb.	...11	.12	.11	.12	.12	.11	.11	.11
Hypophosphorous, 30%, USP, demijohns..............lb.	.....	.85	.....	.85	.85	.85	.85	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.05	.04	.05½	.04½
44%, light, 500 lb bbls......lb.	.11½	.12	.11½	.12	.12	.11	.12½	.11
Laurent's, 250 lb bbls........lb.	.36	.42	.36	.42	.42	.36	.42	.40
Linoleic..................lb.	.16	.16	.16	16	.....	.....	.....	.....
Malic, powd., kegs..........lb.	.45	.60	.45	.60	.60	.45	.60	.48
Metanilic, 250 lb bbls........lb.	.60	.65	.60	.65	.65	.60	.65	.60
Mixed Sulfuric-Nitric..........								
tanks wks..........N unit	.07	.07½	.07	.07½	.07½	.07	.07½	.07
tanks wks..........S unit	.008	.01	.008	.01	.01	.008	.01	.008
Monochloroacetic, tech bbl..lb.	.20	.30	.20	.30	.30	.18	.21	.18
Monosulfonic, bbls..........lb.	1.65	1.70	1.65	1.70	1.70	1.65	1.70	1.65
Muriatic, 18 deg, 120 lb cbys c-1 wks............100 lb.	.....	1.35	.....	1.35	1.35	1.35	1.40	1.35
tanks, wks. 100 lb.		1.00	.....	1.00	1.00	1.00	1.00	1.00
20 degrees, cbys wks...100 lb.	.....	1.45	.....	1.45	....	1.45	....	1.45
N & W, 250 lb bbls...........	.85	.95	.85	.95	.95	.85	.95	.85
Naphthionic, tech, 250 lb.......	.....	Nom.	.....	Nom.	Nom.	.....	.59	.55
Nitric, 36 deg, 135 lb cbys c-wks...............100 lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
40 deg, 135 lb cbys, c-1 wks...............100 lb.	.....	6.00	.....	6.00	6.00	6.00	6.00	6.00
Oxalic, 300 lb bbls wks NY...lb.	.11	.11¼	.10¾	.11½	.11¾	.11	.11¾	.11
Phosphoric 50%, U. S. P.....lb.	.....	.14	.....	.14	.14	.14	.14	.08
Syrupy, USP, 70 lb drs....lb.	.....	.14	.....	.14	]	.14	.16	.14
Commercial, tanks,.....Unit.	.....	.80	.....	.80	.80	.80	.....	.....
Picramic, 300 lb bbls........lb.	.65	.70	.65	.70	.70	.65	.70	.65
Picric, kegs................lb.	.30	.50	.30	.50	.50	.30	.50	.30
Pyrogallic, crystals.......................................lb.	1.50	1.60	1.50	1.60	1.60	1.30	1.40	.86
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.37	.33	.42	.33
Sulfanilic, 250 lb bbls........lb.	.15	.16	.15	.16	.16	.15	.16	.15
Sulfuric, 66 deg, 180 lb cbys lc-1 wks...........100 lb.	1.60	1.95	1.60	1.95	1.95	1.60	1.95	1.60
tanks, wks. ton		15.00	.....	15.00	15.50	15.00	15.50	15.50
1500 lb dr wks......100 lb.	1.50	1.65	1.50	1.65	1.65	1.50	1.65	1.50
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.42½	1.27½	1.42½	1.27½

TWO LOW-PRICED CHLORINATED SOLVENTS

Ethylene Dichloride
Dichlorethyl Ether

These two interesting solvents are being used in a wide variety of applications. Under ordinary plant conditions these solvents are stable and therefore do not require special corrosion resistant equipment.

Their physical characteristics are as follows:

	ETHYLENE DICHLORIDE	DICHLORETHYL ETHER
CHEMICAL FORMULA	$CH_2CL \cdot CH_2CL$	$(CH_2CL \cdot CH_2)_2O$
BOILING POINT 760 MM.	83.5° C.	178° C.
SPECIFIC GRAVITY 20/20° C.	1.2569	1.22
SURFACE TENSION 25° C.	37.5 DYNES/SQ. CM.	41.8 DYNES/SQ. CM.
SPECIFIC HEAT 30° C.	.3054	.369
LATENT HEAT OF VAPORIZATION	141 B.T.U./LB. AT B.P.	128 B.T.U./LB. AT B.P.
FLASH POINT Closed Cup	14° C., 57° F.	55° C., 131° F.
SOLUBILITY IN WATER	INSOLUBLE	INSOLUBLE

A few of the many uses of these chlorinated solvents are:

DEGREASING OF METAL — EXTRACTION PROCESSES — ORGANIC SYNTHESES
DRY-CLEANING — RUBBER SOLVENTS — TEXTILE SOAPS
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DIETHYLENE GLYCOL
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ETHYLENE GLYCOL
ETHYLENE OXIDE
ISOPROPANOL
ISOPROPYL ETHER
METHYL CELLOSOLVE★
METHANOL
TRIETHANOLAMINE
TRIETHYLENE GLYCOL
VINYL CHLORIDE
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Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

15, 1931 amounted to 9,497,124 kilos, increasing from 7,052,854 kilos on hand November 30. Production in the current season as of March 15, 1931 was 3,045,590 kilos, while sales, including consumption by producers, totaled only 601,320 kilos on the same date.

Acid Chromic — Seasonal slackening in most plating lines caused a reduction in total shipments but prices were reported unchanged.

Acid Cresylic — A slight betterment in the volume moving into disinfectant channels was noted, but other industries notably mining were falling behind in demand. Prices were held fairly firm.

Acid Formic — The let-down in textile operations brought about a seasonal decline in shipments going into this industry. Prices were unchanged.

Acid Oxalic — Demand was fair but sales were in limited quantities for immediate delivery indicating a desire on the part of consumers to limit purchasing strictly to early requirements. Prices were being firmly held.

Acid Phosphoric — Buying was in restricted quantities but at unchanged prices.

Acid Salicylic — Sales were larger during the first part of June than was anticipated in most quarters but conditions quieted down considerably as the month closed. Prices were firmly held.

Acid Sulfuric — The market passed through a very listless month with contract shipments holding up to fairly good levels but with spot sales off considerably. With fertilizer activity at a still lower ebb stocks were in evidence but most producers are watching production schedules very closely so as to prevent any large surplus. While prices were said to be slightly unsteady producers were quoting schedule prices.

Alcohol — The market remained very quiet during the period under review. Sales were small while shipments against existing contracts were reported to be below the previous month. The chief interest of the industry turned to the new formula announced by the Bureau of Industrial Alcohol. Users, especially those in the shellac field, are anxiously awaiting trial to see if the chief objections to alcotate as a denaturant is removed in the new formula.

Aluminum Sulfate — Stocks were moving in better quantity into water purification channels. Prices were firm and unchanged.

Ammonia Anhydrous — The advent of warm weather stimulated contract

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Oleum, 20%, 1500 lb. drs 1c-1 wks ....ton	.....	18.50	.....	18.50	18.50	18.50	18.50	18.50
40%, 1c-1 wks net ....ton	.....	42.00	.....	42.00	42.00	42.00	42.00	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.40	.23	.40	.30
Tartaric, USP, gran. powd, 300 lb. bbls...........lb	.....	.31½	.....	.31½	.38½	.33	.38½	.38
Tobias, 250 lb bbls.........lb.	.....	.85	.....	.85	.85	.85	.85	.85
Trichloroacetic bottles......lb.	.....	2.75	.....	2.75	2.75	2.75	2.75	2.75
Kegs..................lb.	.....	2.00	.....	2.00	2.00	2.00	2.00	2.00
Tungstic, bbls...........lb.	1.40	1.70	1.40	1.70	1.70	1.40	2.25	1.00
Albumen, blood, 225 lb bbls..lb.	.38	.40	.38	.40	.40	.38	47	.38
dark,............bbls., lb.	.12	.20	.12	20	.20	.12	.20	.12
Egg, edible..............lb.	.....	.60	.55	.60	.75	.55	.83	.70
Technical, 200 lb cases..lb.	.....	.50	.48	.50	.73	.50	.80	.70
Vegetable, edible.........lb.	.60	.65	.60	.65	.65	.60	.65	.60
Technical.............lb.	.50	.55	.50	.55	.55	.50	.55	.50
Alcohol								
Alcohol Butyl, Normal, 50 gal drs c-1 wks...........lb.	.16¼	.17¼	.16¼	.17¼	.18¼	.17¼	.17¾	.17¼
Drums, 1-c-1 wks........lb.	.16¾	.17¾	.16¾	.17¾	.18¾	.17¾	.18½	.17¾
Tank cars wks..........lb.	.15¾	.16¾	.15¾	.16¾	.17¾	.16¾	.17½	.16¾
Amyl (from pentane) Tanks wks............lb.	.....	.236	.....	.236	.236	.236	1.67	1.67
Diacetone, 50 gal drs del..gal.	1.42	1.60	1.42	1.60	1.60	1.42	1.80	1.42
Ethyl, USP, 190 pf, 50 gal bbls...............gal.	2.55	2.65	2.37	2.75	2.75	2.63	2.75	2.69½
Anhydrous, drums.......gal.	.54	.58	.54	.60	.71	.56	.71	.71
No. 5, 188 pf, 50 gal drs. drums extra.........gal.	.27	.29	.27	.44	50	.40	.51	.48
Tank, cars.............gal.	.....	.24	.24	.38	.48	.37	.50	.46
Isopropyl, ref, gal drs.....gal.	.90	1.00	.90	1.00	1.00	.60	1.30	1.00
Propyl Normal, 50 gal dr..gal.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Alcotate, tanks...........gal.	.....	.60	.60	.60	.....	.....	.....	.....
Aldehyde Ammonia, 100 gal dr lb.	.80	.82	.80	.82	.82	.80	.82	.80
Alpha-Naphthol, crude, 300 lb bbls..................lb.	.60	.65	.60	.65	.65	.60	.65	.65
Alpha-Naphthylamine, 350 lb bbls..................lb.	.32	.34	.32	.34	.34	.32	.34	.32
Alum Ammonia, lump, 400 lb bbls, 1c-1 wks.......100 lb.	3.20	3.50	3.20	3.50	3.50	3.20	3.50	3.25
Chrome, 500 lb casks, wks ....100 lb.	4.50	5.25	4.50	5.25	5.25	4.50	5.50	5.00
Potash, lump, 400 lb casks wks...............100 lb.	3.25	3.50	3.10	3.50	3.50	3.10	3.50	3.00
Soda, ground, 400 lb bbls wks...............100 lb.	3.50	3.75	3.50	3.75	3.75	3.50	3.75	3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.90	24.30	24.30	24.30	24.30	24.30
Chloride Anhydrous,......lb.	.05	.09	.05	.09	.15	.05	.20	.05
Hydrate, 96%, light, 90 lb bbls..................lb.	.16	.17	.16	.17	.18	.16	.18	.17
Stearate, 100 lb bbls.......lb.	.18	.21	.18	.22	.26	.19	.26	25
Sulfate, Iron, free, bags c-1 wks..............100 lb.	1.90	1.95	1.90	1.95	2.05	1.90	2.05	1.95
Coml, bags c-1 wks..100 lb.	1.25	1.30	1.25	1.30	1.40	1.25	1.40	1.40
Aminoazobenzene, 110 lb kegs lb.	.....	1.15	.....	1.15	1.15	1.15	1.15	1.15
Ammonium								
Ammonia anhydrous Com. tanks	.....	.05⅝	.....	.05⅝	.05⅝	.05⅝		
Ammonia, anhyd, 100 lb cyl..lb.	.15½	.15½	.15½	.15½	.15½	.15½	.14½	.14
Water, 26°, 800 lb dr del...lb.	.....	.03½	.....	.03½	.03½	.03½	.03½	.03½
Ammonia, aqua 26° tanks....	.....	.02¾	.02½	.02¾	.02¾	.02½		
Acetate..................lb.	.28	.39	.28	.39	.39	.28		
Bicarbonate, bbls., f.o.b. plant ....100 lb.	.....	5.15	.....	5.15	5.15	5.15	6.50	5.15
Bifluoride, 300 lb bbls......lb.	.21	.22	.21	.22	.22	.21	.22	.21
Carbonate, tech, 500 lb cs..lb.	.10½	.12	.09	.12	.12	.09	.12	.09
Chloride, white, 100 lb. bbls wks..............100 lb.	4.45	5.15	4.45	5.15	5.15	4.45	5.15	4.45
Gray, 250 lb bbls wks....lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Lump, 500 lb cks spot...lb.	.11	.11½	.11	.11½	.11½	.11	.11½	.11
Lactate, 500 lb bbls.......lb.	.15	.16	.15	.16	.16	.15	.16	.15
Ammonium Linoleate.....lb.	.15	.15	.15	.....	.....	.....	.....	.....
Nitrate, tech, casks........lb.	.06	.10	.06	.10	.10	.06	.10	.06
Persulfate, 112 lb kegs.....lb.	.26	.30	.26	.30	.30	.26	.34	.26
Phosphate, tech, powd, 325 lb bbls..................lb.	.11½	.12	.11½	.12	.13	.11½	.13	.12½
Sulfate, bulk c-1.......100 lb.	.....	1.60	1.60	1.80	2.10	1.75	2.40	2.05
Southern points.....100 lb.	.....	1.60	1.60	1.75	2.10	1.82½	2.45	2.05
Nitrate, 26% nitrogen 31.6% ammonia imported bags c. i. f.........ton	34.60	35.00	34.60	35.00	57.60	45.00	60.85	52.40
Sulfocyanide, kegs........lb.	.36	.48	.36	.48	.48	.36	.48	.36
Amyl Acetate, (from pentane) Tanks............... lb.	.....	.222	.....	.222	.236	.222	1.70	1.60
Tech., drs...............lb.	.225	.236	.225	.236	.24	.225	.24	.23
Alcohol, see Fusel Oil........								
Furoate, 1 lb tins.........lb.		5.00	.....	5.00	5.00	5.00		
Aniline Oil, 960 lb drs........lb.	.14½	.16	.14½	.16	.16	.15	.16½	.15
Annatto, fine...............lb.	.34	.37	.34	.37	.37	.34	.37	.34
Anthraquinone, sublimed, 125 lb bbls..................lb.	.50	.55	.50	.55	.90	.50	.90	.80
Antimony, metal slabs, ton lots ....lb.	.....	.07	.06⅝	.07⅛	.09½	.06½	.10	.08⅝
Needle, powd, 100 lb cs....lb.	.08½	.09	.08½	.09	.09½	.08	.10	.09
Chloride, soln (butter of) cbys..................lb.	.13	.17	.13	.17	.17	.13	.18	.13
Oxide, 500 lb bbls.........lb.	.08½	.08¾	.08½	.08¾	.08¾	.07½	.10	.08⅝
Salt, 66%, tins............lb.	.22	.24	.22	.24	.24	.22	.26	.24
Sulfuret, golden, bbls......lb.	.16	.20	.16	.20	.20	.16	.20	.16
Vermilion, bbls............lb.	.38	.42	.38	.42	.42	.38	.42	.38
Archil, conc, 600 lb bbls......lb.	.17	.19	.17	.19	.19	.17	.19	.17
Double, 600 lb bbls........lb.	.12	.14	.12	.14	.14	.12	.14	.12
Triple, 600 lb bbls.........lb.	.12	.14	.12	.14	.14	.12	.16	.12
Argols, 80%, casks..........lb.	.....	.18¾	.....	.18¾	.18¾	.18¾	.18¾	.18¾
Crude, 30%, casks........lb.	.07	.07½	.07	.08	.08	.07¾	.08	.08

Aroclors
Casein

Prices Current and Comment

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withdrawals and spot sales. Prices are being held very firmly.

Ammonium Sulfate — Producers were offering material at $32 a ton ex vessel, Atlantic ports during the past month for delivery over the balance of the summer. Prices for imported are reported as being weak due to a desire on the part of producers to move surpluses during the present season. A striking increase in imports of ammonium sulfate compared with last year is shown by figures for the five months, December to April, issued by the National Fertilizer Association. Such imports amounted to 38,780 tons, compared with 2,904 tons during the same months last ye r, and with 19,324 tons two years ago. A $5 per ton duty on ammonium sulfate was removed in the tariff bill enacted last year. Nitrate of soda imports at the same time declined, the figures for the five-month period being 336,945 tons, against 417,136 tons last year and 536,310 tons two years ago. During the five months, December-April, imports of all fertilizer and fertilizer materials amounted to 69.7 per cent of the imports for the same months of the previous season and 70.1 per cent of the imports for the identical months two seasons ago. April imports of fertilizer and fertilizer materials were 19 per cent less than those for April, 1930, and 34 per cent less than the imports for April, 1929. April exports were 21 per cent less than those for April, 1930, but were 11 per cent larger than the exports for April, 1929. Greatly reduced exports of "prepared fertilizer" and "other fertilizers" occurred during the latest five months compared with the same months of last season as well as the identical months two seasons ago. Canada, Cuba, Japan and British India exports showed marked declines but small increases were noted in the tonnage sent to Ceylon, Java and Madura.

Aniline Oil — Demand for this and other intermediates dropped slightly from the level maintained during the past few months. Sale of dyestuffs was off in the textile trade while the leather industry continued to absorb large quantities. The slackening off in the shipments of intermediates was thought to be temporary and prices were well sustained in all directions.

Antimony — A distinct firmness developed in the market during the last week of the month, raising prices $\frac{3}{4}$ of a cent, the new level being based on 7 cents.

Arabic Gum — Prices were reduced on June 4, white sorts being quoted at 27c as against 28c, while amber sorts was quoted

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Aroclors, wks..............lb.	.20	.40	.20	.40	.40	.20	.....	.....
Arsenic, Red. 224 lb kegs, cs..lb.	.09¾	.10	.09¾	.10	.11	.08¾	.11	.09
White, 112 lb kegs.........lb.	.04	.05	.03¾	.05	.04½	.03¾	.04½	.04
Asbestine, c-1 wks..........ton	.....	15.00	.....	15.00	15.00	15.00	15.00	4.75
Barium								
Barium Carbonate, 200 lb bags wks..................ton	58.00	60.00	58.00	60.00	60.00	58.00	60.00	57.00
Chlorate, 112 lb kegs NY..lb.	.14	.15	.14	.15	.15	.14	.15	.14
Chloride, 600 lb bbl wks...ton	63.00	69.00	63.00	69.00	69.00	63.00	69.00	63.00
Dioxide, 88%, 690 lb drs...lb.	.12	.13	.12	.13	.13	.12	.13	.12
Hydrate, 500 lb bbls.......lb.	.04¾	.05½	.04¾	.05½	.05½	.04¾	.05½	.04¾
Nitrate, 700 lb casks.......lb.	.07½	.08¼	.07½	.08¼	.08¼	.07½	.08¼	.08
Barytes, Floated, 350 lb bbls wks..................ton	23.00	24.00	23.00	24.00	24.00	23.00	24.00	23.00
Bauxite, bulk, mines........ton	5.00	6.00	5.00	8.00	8.00	5.00	8.00	5.00
Beeswax, Yellow, crude bags..lb.	.24	.31	.24	.31	.34	.24	.37	.34
Refined, cases...........lb.	.....	.37	.....	.37	.38	.37	.42	.39
White, cases..............lb.	.34	.36	.34	.36	.53	.34	.53	.51
Benzaldehyde, technical, 945 lb drums wks.............lb.	.60	.65	.60	.65	.65	.60	.65	.60
Benzene								
Benzene, 90%, Industrial, 8000 gal tanks wks..........gal.	.19	.20	.19	.21	.22	.21	.23	.23
Ind. Pure, tanks works....gal.	.19	.20	.19	.21	.22	.21	.23	.23
Benzidine Base, dry, 250 lb bbls..................lb.	.65	.67	.65	.67	.74	.65	.74	.70
Benzoyl, Chloride, 500 lb drs.lb.	.45	.47	.45	.47	1.00	.45	1.00	1.00
Benzyl, Chloride, tech drs....lb.	.....	.30	.....	.30	.25	.25	.25	.25
Beta-Naphthol, 250 lb bbl wk.lb.	.22	.24	.22	.24	.24	.22	.26	.22
Naphthylamine, sublimed, 200 lb bbls..................lb.	1.25	1.35	1.25	1.35	1.35	1.25	1.35	1.35
Tech, 200 lb bbls..........lb.	.58	.65	.58	.65	.65	.53	.68	.60
Blanc Fixe, 400 lb bbls wks..ton	75.00	90.00	75.00	90.00	90.00	75.00	90.00	75.00
Bleaching Powder								
Bleaching Powder, 300 lb drs c-1 wks contract.....100 lb.	2 00	2.35	2.00	2.35	2.35	2.00	2.25	2.00
Blood, Dried, fob, NY......Unit	.....	1.85	1.85	3.00	3.90	3.00	4.60	3.90
Chicago................Unit	1.50	1.60	1.50	2.35	4.50	2.75	5.00	4 40
S. American shipt.......Unit	2.20	2.25	2.20	3.20	4.10	3.15	4.70	4.25
Blues, Bronze Chinese Milori Prussian Soluble........lb.	.....	.35	.....	.35	.35	.35	.35	.32
Bone, raw, Chicago.........ton	31.00	32.00	31.00	32.00	39.00	31.00	42.00	39.00
Bone, Ash, 100 lb kegs.......lb.	.06	.07	.06	.07	.07	.06	.07	.06
Black, 200 lb bbls.........lb.	.05½	.08¼	.05½	.08¼	.08¼	.05½	.08¼	.08¼
Meal, 3% & 50%, Imp....ton	.....	31.00	.....	31.00	31.00	31.00	35.00	30.00
Borax, bags...............lb.	.02½	.03½	.02½	.03½	.03½	02½	.03½	.02½
Bordeaux, Mixture, 16% pwd..lb.	.11½	.13	.11½	.13	.14	.12	.14	.10½
Paste, bbls...............lb.	.11½	.13	.11½	.13	.14	.12	.14	.10
Brazilwood, sticks, shpmt....lb.	26.00	28.00	26.00	28.00	28.00	26.00	28.00	26.00
Bromine, cases..............lb.	.36	.43	.36	.43	.47	.38		
Bronze, Aluminum, powd blk.lb.	.60	1.20	.60	1.20	1.20	.60	1.20	.60
Gold bulk................lb.	.55	1.25	.55	1.25	1.25	.55	1.25	.55
Butyl, Acetate, normal drs..lb.	.17	.175	.17	.175	.20	.17	.195	.184
Tank, wks...............lb.	.16	.175	.16	.175	.186	.16	.186	.181
Aldehyde, 50 gal drs wks...lb.	.34	.44	.34	.44	.44	.34	.70	.34
Carbitol s ee Diethylene Glycol Mono (Butyl Ether)........	.....	.....	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)..........								
Furoate, tech., 50 gal. dr., lb.	.....	.50	.....	.50	.50	.50	.50	.50
Propionate, drs............lb.	.22	.25	.22	.25	.27	.22	.36	.25
Stearate, 50 gal drs........lb.	.25	.30	.25	.30	.30	.25	.60	.25
Tartrate, drs..............lb.	.55	.60	.55	.60	.60	.55	.60	.57
Cadmium, Sulfide, boxes.....lb.	.65	.90	.65	.90	1.75	.90	1.75	.75
Calcium								
Calcium, Acetate, 150 lb bags c-1.................100 lb.	.....	2.00	.....	2.00	4.50	2.00	4.50	4.50
Arsenate, 100 lb bbls c-1 wks....................lb.	.07	.09	.07	.09	.09	.07	.09	.07
Carbide, drs..............lb.	.05	.06	.05	.06	.06	.05	.06	.05
Carbonate, tech, 100 lb bags c-1...................lb.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks................ton	.....	22.75	.....	22.75	22.75	22.75	25.00	22.75
Solid, 650 lb drs c-1 fob wks ....ton	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Nitrate, 100 lb bags.......ton	40.00	43.00	40.00	43.00	43.00	40.00	52.00	42.00
Peroxide, 100 lb. drs.......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Phosphate, tech, 450 lb bbls lb.	.08	.08¾	.08	.08¾	.08¾	.08	.08	.07
Stearate, 100 lb bbls.......lb.	.18	.22	.18	.22	.26	.19	.26	.25
Calurea, bags S. points. c.i.f. ton	.....	88.65	.....	88.65	88.65	88.65	88.15	82.15
Camwood, Bark, ground bbls..lb.	.....	.18	.....	.18	.18	.18	.18	.18
Candelilla Wax, bags........lb.	.14	.14½	.13	.15	.20	.15	.24	.22
Carbitol, (See Diethylene Gycol Mono Ethyl Ether)........	.....	.....	.....	.....	.....	.....	.....	.....
Carbon, Decolorizing, 40 lb bags c-1...................lb.	.08	.15	.08	.15	.15	.08	.15	.08
Black, 100-300 lb cases 1c-1 NY...................lb.	.06	.12	.06	.12	.12	.06	.12	.12
Bisulfide, 500 lb drs 1c-1 NY...................lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Dioxide, Liq. 20-25 lb cyl...lb.	.....	.06	.....	.06	.18	.06	.06	.06
Tetrachloride, 1400 lb drs delivered...............lb.	.06½	.07	.06½	.07	.07	.06½	.07½	.06½
Carnauba Wax, Flor, bags....lb.	.26	.28	.26	.28	.37	.28	.43	.35
No. 1 Yellow, bags........lb.	.....	.36	.23	.40	.33	.25	.40	.33
No. 2 N Country, bags.....lb.	.....	.17¾	.17¾	.23	.27	.20	.32	.28
No. 2 Regular, bags.......lb.	.22	.23	.21	.23	.30	.23	.36	.31
No. 3 N. C...............lb.	.....	.14¼	.14¼	.16	.23	.16	.25	.24
No. 3 Chalky..............lb.	.14½	.15	.14	.15½	.23	.16	.26	.24
Casein, Standard, Domestic.... ground...................lb.	.07	.08	.07	.10	.15½	.09½	.17	.15

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at 9c a decline of ¾ of a cent over May prices.

Benzoin Gum — In common with most of the gums further price reductions occurred during June. The prevailing quotation on June 19 was 28c.

Benzol — With operations in most of the major industries still operating at very restricted schedules, spot sales and also shipments against existing contracts were considerably below normal. A slight flurry was felt in the rubber trade, but sales abroad were still off. No change in published prices was made during the month. In most quarters it was felt that little improvement through the summer period was likely. By-product coke-ovens were operated in 1930 at forty-six furnace plants and forty-three other plants, there being two more of the latter than in 1929. The by-products output and sales of the plants operating in 1930 were, according to data published by the Bureau of Mines of the United States Department of Agriculture, as follows:—[1]

	Production	*Quantity*
Tar, gallons	602,485,929	314,865,294
Ammonia—		
sulphate, pounds	1,341,919,960	1,310,588,322
ammonia liquor (NH_3 content), lbs.	49,031,133	45,368,290
Totals	....	....
sulphate equivalent of all forms, lbs.	1,538,044,492	1,492,061,482
Light oil and derivatives—		
crude light oil, gals.	[2]178,325,952	9,941,904
benzene, crude and refined, gals.	19,142,910	19,187,627
motor benzene, gals	101,862,692	102,572,989
toluene, crude and solvent naphtha, gals.	4,078,274	3,647,773
xylene, gals.	2,040,024	1,891,764
other light oil products, gals	6,475,725	1,983,034
Totals	[3]145,432,827	151,308,514
Naphthalene, crude and refined, lbs.	12,640,102	13,028,904
Tar derivatives—		
creosote oil[4], gals.	29,236,681	28,570,764
phenol (crude) gals.	136,971	104,546
pitch of tar, net tons	106,334	7,465
other tar derivatives	....	....
Other products[5]	....	....

[1]Includes products of tar distillation conducted by coke-oven operators under same corporate name, excepting, however, phenol, and other tar acids produced at Clairton, Pa., which are covered by report of the U. S. Tariff Commission.

[2]Refined on the premises to make the derived products shown, 173,328,254 gallons.

[3]Total gallons of derived products.

[4]Includes creosote oil distilled as such, and distillate in coal-tar solution.

[5]Crude products, tar paint, carbolate, sodium prussiate, sulphur, smoke compound, extil covering, and cyanogen.

Bromine — The market showed no change when announcement was made of the proposed new plant to be located at Wilmington by the Dow and Ethyl Gasoline interests to use the former du Pont process for extraction from sea water. Imports of ethylene dibromide entered for consumption during the first quarter of 1931 amounted, according to preliminary figure, to 533,316 pounds, valued at $119,865, compared to 600,660 pounds,

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cellosolve (see Ethylene glycol mono ethyl ether).........								
Acetate (see Ethylene glycol mono ethyl ether acetate)..								
Celluloid, Scraps, Ivory cs....lb.	.13	.15	.13	.15	.20	.20	.30	.20
Shell, cases..............lb.	.18	.20	.18	.20	.20	.18	.20	.18
Transparent, cases........lb.	.....	.15	.....	.15	.15	.15	.32	.15
Cellulose, Acetate, 50 lb kegs .lb.	.80	1.25	.80	1.25	1.25	.80	1.25	1.20
Chalk, dropped, 175 lb bbls...lb.	.03	.03¾	.03	.03¾	.03¾	03	.03¾	.03
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.03½	.02	.03½	.02
Light, 250 lb casks........lb.	.02½	.03½	.02½	.03½	.03½	.02½	.03½	02½
Charcoal, Hardwood, lump, bulk wks..................bu.	.18	.19	.18	.19	.19	.18	.19	.18
Willow, powd, 100 lb bbl wks..................lb.	.06	.06½	.06	.06½	.06½	06	.06½	.06
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.05	04	.05	.04
Chestnut, clarified bbls wks,..lb.	.02	.03	.02	.03	.03	02½	.02	.03½
25% tks wks..............lb.	.01¾	.02½	.01¾	.02½	.02½	01¾	.02½	.01½
Powd, 60%, 100 lb bgs wks.lb.	.....	.04½	.....	.04½	.04½	.04½	04 ¹/₈	.04½
Powd, decolorized bgs wks..lb.	.05½	.06	.05½	.06	.06	05½	.06	.05½
China Clay, lump, blk mines.ton	8.00	9.00	8.00	9.00	9.00	8.00	9.00	8.00
Powdered, bbls...........lb.	.01¾	.02	.01¾	.02	.02	.01¾	.02	.01¾
Pulverized, bbls wks.......ton	10.00	12.00	10.00	12.00	12.00	10.00	12.00	10.00
Imported, lump, bulk.....ton	15.00	25.00	15.00	25.00	25.00	15.00	25.00	15.00
Powdered, bbls...........lb.	.01¾	.03	.01¾	.03	.03	.01¾	.03½	.01¾
Chlorine								
Chlorine, cyls 1c-1 wks contract......................lb.	.07	.08½	.07	.08½	.08½	.07	.08½	.07
cyls, cl wks,. contract ...lb.	.04	.04½	.04	.04½	.04½	.04	.04½	.04½
Liq tank or multi-car lot cyls wks contract............lb.	.01¾	.02½	.01¾	.02½	.025	.01¾	.03	.025
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks............lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.08½
Chloroform, tech, 1000 lb drs..lb.	.15	.16	.15	.16	.16	.15	.20	.16
Chloropicrin, comml cyls.....lb.	1.00	1.35	1.00	1.35	1.35	1.00	1.35	1.00
Chrome, Green, CP..........lb.	.26	.29	.26	.29	.29	.26	.29	.2C
Commercial................lb.	.06½	.11	.06½	.11	.11	.06½	.11	.06½
Yellow...................lb.	.16	.18	.16	.18	.18	.16	.18	.15
Chromium, Acetate, 8% Chrome bbls..................lb.	.04¾	.05¾	.04¾	.05¾	.05¾	.04¾	.05¾	.04¾
20° soln, 400 lb bbls.....lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	.28	.27	.28	.27
Oxide, green, bbls.........lb.	.34½	.35½	.34½	.35½	.35½	.34½	.35½	.34½
Coal tar, bbls..............bbl	10.00	10.50	10.00	10.50	10.50	10.00	10.50	10.00
Cobalt Oxide, black, bags....lb.	1.35	1.45	1.35	2.22	2.22	2.10	2.22	2.10
Cochineal, gray or black bag..lb.	.52	.57	.52	.57	1.01	.52	1.01	.95
Teneriffe silver, bags.......lb.	.....	.57	.55	.57	.95	.54	.95	.95
Copper								
Copper, metal, electrol....100 lb.	8.50	9.00	8.00	10.36	17.78	9.50	24.00	17.00
Carbonate, 400 lb bbls.....lb.	.08½	.16½	.08½	.16½	.21½	.08½	.25	.13
Chloride, 250 lb bbls.......lb.	.22	.25	.22	.25	.28	.22	.28	.25
Cyanide, 100 lb drs........lb.	.41	.42	.41	.42	.45	.41	.60	.44
Oxide, red, 100 lb bbls.....lb.	.15½	.18	.15½	.18	.32	.15½	.32	.16½
Sub-acetate verdigris, 400 lb bbls..................lb.	.18	.19	.18	.19	.19	.18	.19	.18
Sulfate, bbls c-1 wks...100 lb.	.....	3.70	3.70	4.95	5.50	3.95	7.00	5.50
Copperas, crys and sugar bulk c-1 wks...............ton	13.00	14.00	13.00	14.00	14.00	13.00	14.00	13.00
Cotton, Soluble, wet, 100 lb bbls..................lb.	.40	.42	.40	.42	.42	.40	.42	.40
Cottonseed, S. E. bulk c-1...ton	.....	26.50	.....	26.50	.....	.....	.....	.....
Meal S. E. bulk..........ton	.....	.....	.....	.....	.....	.....	.....	.....
7% Amm., bags mills...ton	37.50	38.00	37.50	38.00	38.00	37.50	38.00	37.50
Cream Tartar, USP, 300 lb. bbls..................lb.	.....	.22¾	.22¾	.24½	.27	.24½	.28	26½
Creosote, USP, 42 lb cbys....lb.	.40	.42	.40	.42	.42	.40	.42	.40½
Oil, Grade 1 tanks.......gal.	.13	.14	.13	.14	.16	.15	.19	.15
Grade 2...............gal.	.11	.12	.11	.12	.14	.13	.23	.13
Grade 3...............gal.	.11	.12	.11	.12	.14	.13	.28	.13
Cresol, USP, drums.........lb.	.13	.17	.13	.17	.17	.14	.17	.14
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.36	.32	.36	.32
Cudbear, English............lb.	.16	.17	.16	.17	.17	.16	.17	.16
Cutch, Rangoon, 100 lb bales..lb.	.11	.13	.11	.13	.13	.11	.16	.12½
Borneo, Solid, 100 lb bale..lb.	.06½	08½	.06½	.08½	.08½	.06½	.08½	.08
Cyanamide, bulk c-1 wks Nitrogen unit.............	.....	1.10	1.10	1.64	2.00	1.70	2.00	2.00
Dextrin, corn, 140 lb bags.100 lb.	.....	3.72	3.47	4.02	4.82	4.42	4.92	4.62
White, 140 lb bags.....100 lb.	3.42	3.67	3.42	4.02	4.77	4.17	4.87	4.57
Potato, Yellow, 220 lb bgs..lb.	.08	.09	.08	.09	.09	.08	.09	.08
White, 220 lb bags 1c-1....lb.	.08	.09	.08	.09	.09	.08	.09	.08
Tapioca, 200 lb bags 1c-1...lb.	.08¼	.08¾	.08¼	.08¾	.08¼	.08	.08¼	.08
Diamylphthalate, drs wks...gal.	.....	3.80	.....	3.80	3.80	3.80	3.80	3.80
Dianisidine, barrels..........lb.	2.35	2.70	2.35	2.70	2.70	2.35	3.10	2.70
Dibutylphthalate, wks.......lb.	.24½	.28	.24½	.28	.28	.24½	.26½	.26½
Dibutyltartrate, 50 gal drs....lb.	.29½	.31½	.29½	.31½	.31½	.29½	.31½	.29½
Dichloroethylether, 50 gal drs lb.	.....	.06	.....	.06	.07	.05	.13	.05
Dichloromethane, drs wks....lb.	.55	.65	.55	.65	.65	.55	.65	.55
Diethylamine, 400 lb drs.....lb.	2.75	3.00	2.75	3.00	3.00	2.75	3.00	2.75
Diethylcarbonate, drs ......gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Diethylaniline, 850 lb drs.....lb.	.55	.60	.55	.60	.60	.55	.60	.55
Diethyleneglycol, drs........lb.	.14	.16	.14	.16	.13	.10	.13	.10
Mono ethyl ether, drs....lb.	.....	.16	.....	.16	.16	.13	.15	.13
Mono butyl ether, drs....lb.	.24	.30	.24	.30	.30	.24	.30	.25
Diethylene oxide, 50 gal dr....lb.	.....	.50	.....	.50	.50	.50	.50	.50
Diethylorthotoluidin, drs.....lb.	.64	.67	.64	.67	.67	.64	.67	.64
Diethyl phthalate, 1000 lb drums.................lb.	.24	.26	.24	.26	.26	.24	.26	.24
Diethylsulfate, technical, 50 gal drums.................lb.	.30	.35	.30	.35	.35	.30	.35	.30
Dimethylamine, 400 lb drs...lb.	.....	2.62	.....	2.62	2.62	2.62	2.62	2.62
Dimethylaniline, 340 lb drs...lb.	.26	.28	.26	.28	.28	.26	.32	.26

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

and $127,136 in the corresponding period of 1930, or a decrease of about 11 per cent in weight and 6 per cent in value. The 1930 imports of 3,023,484 pounds, valued at $648,455 were more than a sixfold increase over the 443,004 pounds, worth $104,917 entered for consumption in 1929.

Butyl Alcohol — Trading slumped off during the last half of the month but producers report that the total tonnage for June would probably equal or even slightly better the figure for May.

Calcium Acetate — Producers were unable to point to any new angles in the market situation. Production still continues to run ahead of consumption and stocks on hand show almost a steady increase from month to month. No change in prices have been made and it is felt in most quarters that this course is very unlikely as in the past it has not afforded any relief from accumulating stocks. Data for the first four months of 1931 as compared with 1930 is as follows:

1931	*Production*	*Shipments*	*Stocks, end of month*
January.....	8,245,279	5,194,666	22,938,764
February....	7,325,701	3,519,769	26,744,696
March......	7,508,535	4,531,368	29,721,863
April	4,517,202	5,277,885	28,961,180
Totals, 4 months..	27,596,717	18,523,688	....
1930			
January.....	9,440,077	2,910,091	11,936,106
February....	7,578,839	3,675,484	15,839,461
March......	9,079,069	6,296,684	18,621,846
April.......	8,100,875	4,855,829	21,866,892
Totals 4 months.	34,198,860	17,738,088	

Calcium Chloride — As the weather became warmer a noticeable increase in demand for contract shipments was reported for dust laying and refrigerating purposes. Prices were unaltered for both domestic and imported.

Carnauba Wax — The higher prices prevailing in the past two months were partly lost during June when shipments abroad coupled with a lessening in demand brought about reductions in all grades. The prices as the month closed were as follows: No. 1, 36c; No. 2, North Country, 17¾c., No. 3, N. C., 14¼c; Chalky, 14½c; Japan, 9½c. Further reductions are likely as stocks are accumulated.

Casein — No improvement was in evidence in this market and rumors were in the trade of sales under 7 cents for the 20-30 mesh material although most producers and selling agents were adhering to this price. Foreign material was also said to have been offered at prices below published schedules.

Chlorine — Shipments for water treatment continued to expand and most producers were of the opinion that shipments for June would show a healthy increase

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.50	.45	50	.45
Dinitrobenzene, 400 lb bbls...lb.	.15½	.16½	.15½	.16½	.16½	.15½	16½	.15
Dintrochlorobenzene, 400 lb bbls..................lb.	.13	.15	.13	.15	.15	.13	.15	.1
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.37	.34	.37	.34
Dinitrophenol, 350 lb bbls....lb.	.29	.30	.29	.30	.32	.31	32	.31
Dinitrotoluene, 300 lb bbls...lb.	.16	.17	.16	.17	.18	.16	.19	.17
Diorthotolyguanidine, 275 lb bbls wks..............lb.	.42	.46	.42	.46	.46	.42	.49	.42
Dioxan (See Diethylene Oxide)	.....	.....	.....	.....	...	.....	.....	.....
Diphenyl...................lb.	.20	.40	.20	.40	.50	.20	.50	.40
Diphenylamine..............lb.	.37	.38	.37	.38	.40	.38	.47	.40
Diphenylguanidine, 100 lb bbl lb.	.30	.35	.30	.35	.35	.30	.40	.30
Dip Oil, 25%, drums........lb.	.26	.30	.26	.30	.30	.26	.30	.26
Divi Divi pods, bgs shipmt..ton	28.00	29.00	28.00	35.00	46.50	35.00	57.00	46.50
Extract.................lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Egg Yolk, 200 lb cases.......lb.	.46	.47	.45	.58	.80	.72	.84	.77
Epsom Salt, tech, 300 lb bbls c-1 NY............100 lb.	1.70	1.90	1.70	1.90	1.90	1.70	1.90	1.70
Ether, USP anaesthesia 55 lb. drs. ....lb.	.....	.23	.23	.28	.28	.21	.39	.38
USP (Conc.)..............lb.	.09	.10	.09	.10	.....	.....	.....	.....
Ethyl Acetate, 85% Ester, ... tanks.................lb.	.....	.08	.08	.088	.115	.085	.122	.108
drums.................lb.	.09	.095	.09	.10	.158	.094	.129	.111
Anhydrous, tanks.........lb.	.....	.119	.....	.119	.142	.119		
drums.................lb.	.115	.121	.115	.121	.156	.115		
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.68	.65	.68	.65
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	1.11	.88	1.11	1.05
Bromide, tech, drums ......lb.	.50	.55	.50	.55	.55	.50	.55	.50
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.90	1.85	1.90	1.85
Chloride, 200 lb. drums....lb.	.....	.22	.....	.22	.22	.22	.22	.22
Chlorocarbonate, cbys......lb.	.....	.30	.....	.30	.40	.30	.40	.35
Ether, Absolute, 50 gal drs..lb.	.50	.52	.50	.52	.52	.50	.52	.50
Furoate, 1 lb tins ....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Lactate, drums works......lb.	.25	.29	.25	.29	.29	.25	.35	.25
Methyl Ketone, 50 gal drs..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Oxalate, drums works......lb.	.45	.55	.45	.55	.55	.45	.55	.45
Oxybutyrate, 50 gal drs wks.lb.	.....	.30½	.....	.30½	.30½	.30½	.36	.30
Ethylene Dibromide, 60 lb dr .lb.	.....	.70	.....	.70	.70	.70	.70	.79
Chlorhydrin, 40%, 10 gal cbys. chloro. cont............lb.	.75	.85	.75	.85	.85	.75	.85	.75
Dichloride, 50 gal drums...lb.	.05	.07	.05	.07	.07	.05	.10	.05
Glycol, 50 gal drs wks.....lb.	.25	.28	.25	.28	.28	.25	30	.25
Mono Butyl Ether drs wks.	.25	.27	.25	.27	.27	.23	.31	.23
Mono Ethyl Ether drs wks	.17	.20	.17	.20	.20	.16	.24	.16
Mono Ethyl Ether Acetate dr. wks..................	.19½	.23	.19½	.23	.23	.19	.26	.19
Mono Methyl Ether, drs.lb.	.21	.23	.21	.23	.23	.19	.23	.19
Stearate.................	.18	.18	.18	.18	.....	.....	.....	.....
Oxide, cyl................lb.	.....	2.00	.....	2.00	2.00	2.00		
Ethylidenaniline............lb.	.45	.47½	.45	.47½	.47½	.45	.65	.45
Feldspar, bulk..............ton	15.00	20.00	15.00	20.00	25.00	15.00	25.00	20.00
Powdered, bulk works.....ton	15.00	21.00	15.00	21.00	21.00	15.00	21.00	15.00
Ferric Chloride, tech, crystal 475 lb bbls.............lb.	.05	.07½	.05	.07½	.07½	.05	.09	.05
Fish Scrap, dried, wks......unit	.....	3.00&10	3.00&10	4.25&10	4.35&10	3.90&10	4.25&10	3.65&10
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	3.50&50	.....	3.50&50	3.50&50	3.20&50	4.00&50	3.50&50
Fluorspar, 98%, bags...........	41.00	46.00	41.00	46.00	46.00	41.00	46.00	41.00

Formaldehyde

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Formaldehyde, aniline, 100 lb. drums.................lb.	.37½	.42	.37½	.42	.42	.37½	.42	.37
USP, 400 lb bbls wks......lb.	.06	.07¾	.06	.07¾	.08	.06	.10	.08½
Fossil Flour................lb.	.02½	.04	.02½	.04	.04	.02½	.04	.02½
Fullers Earth, bulk, mines ..ton	15.00	20.00	15.00	20.00	20.00	15.00	20.00	15.00½
Imp. powd c-1 bags.......ton	24.00	30.00	24.00	30.00	30.00	24.00	30.00	25.00
Furfural (tech.) drums, wks..lb.	.....	.10	.....	.10	.15	.10	.19½	.17
Furfuramide (tech) 100 lb dr..lb.	.....	.30	.....	.30	.30	.30	.30	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Alcohol, (tech) 100 lb dr....lb.	.....	.50	.....	.50	.50	.50	.50	.50
Furoic Acid (tech) 100 lb dr...lb.	.....	.50	.....	.50	.50	.50	1.00	.50
Fusel Oil, 10% impurities ...gal.	.. ..	1.35	.....	1.35	1.35	1.35	1.35	1.35
Fustic, chips...............lb.	.04	.05	.04	.05	.05	.04	.05	.04
Crystals, 100 lb boxes......lb.	.20	.22	.20	.22	.22	.20	.22	.20
Liquid, 50°, 600 lb bbls....lb.	.09	10	.09	.10	.10	.09	.10	.09
Solid, 50 lb boxes..........lb.	.14	.16	.14	.16	.16	.14	.16	.14
Sticks....................ton	25.00	26.00	25.00	26.00	26.00	25.00	26.00	25.00
G Salt paste, 360 lb bbls.....lb.	.45	.50	.45	.50	.50	.45	.52	.45
Gall Extract................lb.	.18	.20	.18	.20	.20	.18	.21	.18
Gambier, common 200 lb cs...lb.	.....	.07	.06½	.07	.07	.06	.07	06
25% liquid, 450 lb bbls....lb.	08	10	.08	.10	.10	.08	.14	.08
Singapore cubes, 150 lb bg..lb.	.09½	.09	.09½	.09	.09	.08½	.09	.08½
Gelatin, tech, 100 lb cases....lb.	.45	.50	.45	.50	.50	.45	.50	.45
Glauber s Salt, tech, c-1 wks...............100 lb.	1.00	1.70	1.00	1.70	1.70	1.00	1.70	.70
Glucose (grape sugar) dry 70-80° bags c-1 NY........100 lb.	3.24	3.34	3.24	3.34	3.34	3.24	3.34	3.20
Tanner's Special, 100 lb bags ....100 lb.	.....	3.14	.....	3.14	3.14	3.14	3.14	3.14
Glue, medium white, bbls ...lb.	.22	.24	.22	.24	.24	.20	.24	.20
Pure white, bbls...........lb.	.25	.26	.25	.26	.26	.22	.26	.22
Glycerin, CP, 550 lb drs.....lb.	.....	.11½	.11½	.14½	.14½	.12½	.16	.13½
Dynamite, 100 lb drs..... lb.	.....	.09¾	.09¾	.12¼	.12¼	.11	.12½	.10½
Saponification, tanks......lb.	.....	.06¼	.06½	.07½	.08	.07½	.08½	.07½
Soap Lye, tanks...........lb.	.....	.05½	.05½	.07	.07½	.06¾	.07½	.06½
Graphite, crude, 220 lb bgs...ton	15.00	35.00	15.00	35.00	35.00	15.00	35.00	15.00
Flake, 500 lb bbls.........lb.	.06	09	.06	.09	.09	.06	.09	06

Gums

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Gum Accroides, Red, coarse and fine 140-150 lb bags......lb.	.03¾	.04½	.03¾	.04½	.04½	.03¾	.04½	.03
Powd, 150 lb bags.........lb.	.06	.06½	.06	.06½	.06½	.06	.06½	.06½

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

over May. Sales in the spot market were light but at unchanged prices.

Cobalt Oxide — Producers of this commodity announced on June 20 a reduction bringing the new level for the black oxide down to $1.35 per lb. in 350 lb. barrels and 10c higher in lesser quantities.

Copper — With the change in commodity markets generally brought about by the better sentiment after President Hoover's announcement on the debt moratorium copper showed a definite upward swing and prices rebounded from the low of 8c to 9c towards the latter part of the month. In the last few days of trading, however, metal was available under 9c. Stocks of refined copper in North and South America on June 1 amounted to 398,667 tons an increase of 30,746 tons or 61,492,000 pounds over stocks of 367,921 tons on May 1, and comparing with 308,646 tons on June 1, 1930. Stocks of blister copper on June 1 were 190,578 tons compared with 193,876 tons on May 1 and 198,811 tons on April 1, 1931, according to the American Bureau of Metal Statistics. Production of refined copper in May was 102,695 tons or a daily rate of 3,313 tons against 100,501 tons or a daily rate of 3,350 tons in April and comparing with 132,183 tons or a daily rate of 4,264 tons in May, 1930.

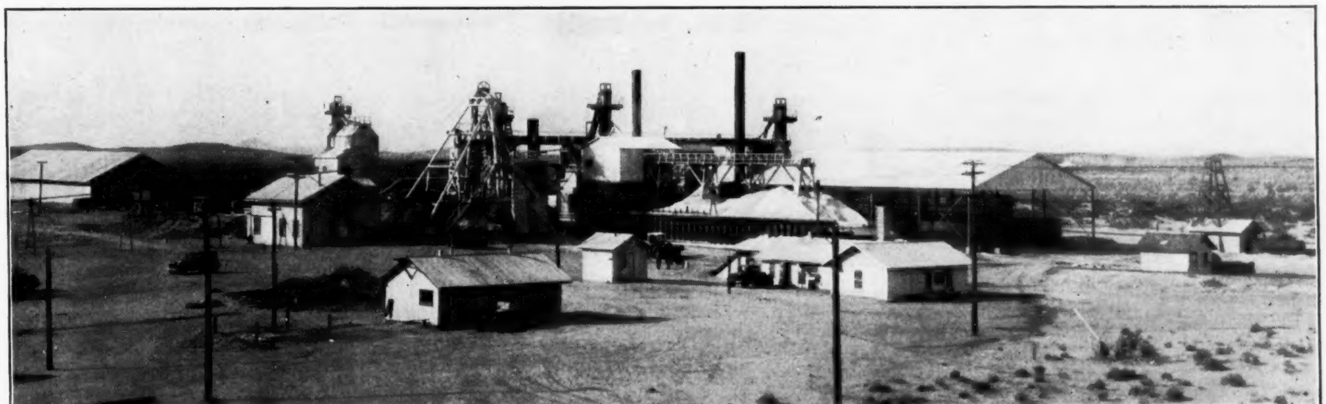
Copperas — The continued curtailment of steel activity has aided in holding this chemical in a very strong position. Prices have not been changed and in some quarters it was thought that some effort to increase them later in the year might be made. This will of course depend a great deal on whether capacity in the steel centers picks up to any extent.

Copper Sulfate — With the metal down to as low as 8c in the early part of the month producers of the sulfate decided to reduce the price on June 5 to $3.70 per 100 lbs., f. o. b. New York for carloads. This drop of 20 cents together with the reduction of 35c the month previous brings copper sulfate down to a new low covering a long period of years. Actual shipments are reported as being in fairly good volume considering conditions in the agricultural sections. Exports are also said to be holding up. Plants are reported as being active in maintaining stocks against the active shipping season.

Corrosive Sublimate — With mercury prices dropping to new low figures producers of mercury salts put into effect a 5c reduction, the new price being based on $1.30 for the U. S. P. granulated and powdered.

Cream of Tartar — The competitive state existing between foreign and domestic material was again reflected in a further

	Current Market		1931		1930		1929	
			Low	High	High	Low	High	Low
Yellow, 150-200 lb bags....lb.	18	.20	.18	.20	.20	.18	.20	.18
Animi (Zanzibar) bean & pea 250 lb cases............lb.	.35	.40	.35	.40	.40	.35	.40	.35
Glassy, 250 lb cases.......lb.	.50	.55	.50	.55	.55	.50	.55	.50
Asphaltum, Barbadoes (Manjak) 200 lb bags.............lb.	.09	.12	.09	.12	.12	.09	.12	.09
Egyptian, 200 lb cases.......lb.	.15	.17	.15	.17	.17	.15	.17	.15
Gilsonite Selects, 200 lb bags ....ton	58.00	65.00	58.00	65.00	65.00	58.00	65.00	58.00
Damar Batavia standard 136, lb cases...................lb.	.10	.10½	.11½	.13	.20	.14	.26	.22
Batavia Dust, 160 lb bags.....lb.	.05	.05½	.05½	.06	.11	.06	.11	.10½
E Seeds, 136 lb cases.......lb.	.06	.06½	.07	.08	.13	.08	.17½	.15
F Splinters, 136 lb cases and bags...................lb.	.05½	.06	.06½	.07½	.13½	.07	.13½	.13
Singapore, No 1, 224 lb cases lb.	.15	.15½	.13½	.15	.24	.18½	.30½	.26
No. 2, 224 lb cases........lb.	.08	.08½	.08½	.10	.20½	.13	.24	.21½
No. 3, 180 lb bags.........lb.	.04½	.05	.05	.06	.11½	.07	.14	.10
Benzoin Sumatra, U. S. P. 120 lb cases..................lb.	.28	.30	.28	.34	.40	.33	.40	.38
Copal Congo, 112 lb bags, clean opaque.................lb.	.16½	.17	.16	.17	.17	.16	.17	.14
Dark, amber.............lb.	.06	.07	.06½	.07½	.08	.07¾	.09	.08¾
Light, amber.............lb.	.12½	.14	.12½	.14	.14	.12½	.14	.12½
Water white.............lb.	.37	.45	.37	.45	.45	.37	.36	.35
Mastic......................lb.	.50	.52	.48	.58	.65	.57	.65	.58
Manila, 180-190 lb baskets								
Loba A...................lb.	.10	.11	.11	.13	.17½	.13	.17½	.17
Loba B...................lb.	.08	.08½	.09	.10½	.16½	.13½	.16½	.15½
Loba C...................lb.	.07½	.08	.08½	.10	.14	.10	.14½	.13½
M A Sorts...............lb.	05	.05½	.05½	.06½	.....	.....	.....	.....
D B B Chips.............lb.	.06	.06½	.07	.08	.....	.....	.....	.....
East Indies chips, 180 lb bags lb.	.05	.05½	.05	.05½	.11	.09	.11	.10
Pale bold, 224 lb cs......lb.	.15½	.16	.15½	.16	.21	.17½	.21	.20
Pale nubs, 180 lb bags....lb,	.08	.08½	.08	.09	.16	.12½	.16	15
Pontianak, 224 lb cases....								
Bold gen No 1.........lb.	.15½	.16	.16	.17	.21	.19	.23	.20
Gen chips spot..........lb.	.07	.08	.07	.08½	.15	.13½	.15	.14½
Elemi, No. 1, 80-85 lb cs...lb.	.09	.09½	.10	.12	.14	.12½	.14	.13½
No. 2, 80-85 lb cases.....lb.	.08½	.09	.09½	.11½	.13½	.12	.13½	.13
No. 3, 80-85 lb cases.....lb.	.08	.08½	.08½	.11	.13	.11	.13	.12
Kauri, 224-226 lb cases No. 1	.42	.48	.43	.50	.57	.48	.57	.50
No. 2 fair pale..........lb.	.24	.25	.26	.29	.38	.32	.38	.35
Brown Chips, 224-226 lb cases...............lb.	.10	.12	.10	.12	.12	.10	.12	.10
Bush Chips, 224-226 lb. cases...............lb.	.26	.28	.28	.34	.40	.38	.40	.38
Pale Chips, 224-226 lb cases ....lb.	.19	21	.19	.22	.26	.24½	.26	.24½
Sandarac, prime quality, 200 lb bags & 300 lb casks...lb.	.18	.20	.18	.22	.40	.27	.72	.35
Helium, 1 lit. bot. ....lit.	.....	25.00	.....	25.00	25.00	25.00	.20	.17
Hematine crystals, 400 lb bbls lb.	.14	.18	.14	.18	.18	.14	.20	.14
Paste, 500 bbls............lb.	.....	.11	.....	.11	.11	.11	.11	.11
Hemlock 25%, 600 lb bbls wks lb.	.03	.03½	.03	.03½	.03½	.03	.03¾	.03
Bark.......................ton	.....	16.00	.....	16.00	16.00	16.00	17.00	16.00
Hexalene, 50 gal drs wks......lb.	.....	.60	.....	.60	.60	.60	.60	.60
Hexamethylenetetramine, drs.lb.	.46	.50	.46	.50	.50	.46	.58	.48
Hoof Meal, fob Chicago....unit	.....	2.50	.....	2.50	3.75	2.50	4.00	3.75
South Amer. to arrive....unit	.....	2.70	.....	2.70	3.75	2.70	3.90	3.75
Hydrogen Peroxide, 100 vol, 140 lb cbys................lb.	.21	.24	.21	.24	.26	.21	.26	.24
Hydroxyamine Hydrochloride lb.	.....	3.15	.....	3.15	3.15	3.15		
Hypernic, 51°, 600 lb bbls....lb.	.12	.15	.12	.15	.15	.12	.15	.12
Indigo Madras, bbls.........lb.	1.28	1.30	1.28	1.30	1.30	1.28	1.30	1.28
20% paste, drums.........lb.	.15	.18	.15	.18	.18	.15	.18	.15
Synthetic, liquid..........lb.	.....	.12	.....	.12	.12	.12	.12	.12
Iron Chloride, see Ferric or Ferrous								
Iron Nitrate, kegs...........lb.	.09	.10	.09	.10	.10	.09	.10	.09
Coml, bbls..........100 lb.	2.50	3.25	2.50	3.25	3.25	2.50	3.25	2.50
Oxide, English..........lb.	.10	.12	.10	.12	.12	.10	.12	.10
Red, Spanish...........lb.	.02¾	.03¼	.02½	.03¼	.03¼	.02¾	.03¼	.02¾
Isopropyl Acetate, 50 gal drs gal.	.85	.90	.85	.90	.90	.85	.90	.85
Japan Wax, 224 lb cases......lb.	.09½	10	.09½	.11	.15½	.11½	.18	.16
Kieselguhr, 95 lb bgs NY....... Brown.................ton	60.00	70.00	60.00	70.00	70.00	60.00	70.00	60.00
Lead Acetate, bbls wks...100 lb.	9.50	10.00	9.50	11.00	13.50	10.50	13.50	13.00
White crystals, 500 lb bbls wks.................100 lb.	.....	11.00	10.50	12.25	14.50	11.50	14.50	14.00
Arsenate, drs 1c-1 wks.....lb.	.11	.13	.11	.14	.16	.13	.15	.13
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1.00		
Metal, c-1 NY........100 lb.	.....	4.40	3.75	4.60	7.75	5.10	7.75	6.10
Nitrate, 500 lb bbls wks....lb.	.13	.14	.13	.14	.14	.13	.14	.14
Oleate, bbls..............lb.	.17½	.18	.17½	.18	.18	.17½	.18	.17½
Oxide Litharge, 500 lb bbls.lb.	.07½	.08	.07½	.08	.08¾	.08¼	.08¾	.08½
Red, 500 lb bbls wks....lb.	.07¾	.08¼	.07¾	.08¼	.09¾	.08¾	.09¾	.09½
White, 500 lb bbls wks...lb.	.07¼	.08	.07¼	.08	.09½	.07¼	.09½	.09
Sulfate, 500 lb bbls wk...lb.	.06¾	.07	.06¾	.07	.08¾	.06¾	.08¾	.08½
Leuna saltpetre, bags c.i.f. ..ton	.....	57.60	.....	57.60	57.60	57.60	57.00	52.00
S. points c. i. f............ton	.....	57.90	.....	57.90	57.90	57.90	57.30	52.30
Lime, ground stone bags.....ton	.....	4.50	.....	4.50	4.50	4.50	4.50	4.50
Live, 325 lb bbls wks...100 lb.	.....	1.05	.....	1.05	1.05	1.05	1.05	1.05
Lime Salts, see Calcium Salts								
Lime-Sulfur soln bbls........gal.	.15	.17	.15	.17	.17	.15	.17	.15
Lithopone, 400 lb bbls 1c-1 wks ....lb.	.04¾	.05	.04¾	.05	.05¾	.04¾	.06½	.05¾
Logwood, 51°, 600 lb bbls.....lb.	.07	.08	.07	.08	.08½	.07	.08½	.08½
Chips, 150 lb bags.........lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Solid, 50 lb boxes.........lb.	.12	.12½	.12	.12½	.12½	.12½	.12½	.12½
Sticks...................ton	24.00	26.00	24.00	26.00	26.00	24.00	26.00	24.00
Lower grades............lb.	.07½	.08	.07½	.08	.08	.07½	.08	.07½
Madder, Dutch.............lb.	.22	.25	.22	.25	.25	.22	.25	.22
Magnesite, calc, 500 lb bbl...ton	50.00	60.00	50.00	60.00	60.00	50.00	60.00	50.00



Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

reduction of cream of tartar. The domestic is now quoted at 23¼c as against 23¾c while the imported is bringing 23c. Stocks were somewhat reduced with the advent of warm weather but no improvement in the price situation is looked for for several weeks at least.

Dextrin — Prices were slightly higher at the end of the month due to a betterment in the demand from certain industries. While sales were numerous, in most cases they were for small quantities, indicating that buyers are still purchasing for immediate consumption.

Egg Yolk — A sharp increase was made in egg products during the past month. The revised prices are as follows: albumen crystals, 60c; yolk granular, 48c; yolk spray, 50c.

Ether — Leading producers placed in effect an important reduction on U.S.P. and concentrated effective June 8, as follows:

Ether U.S.P. and Concentrated

600 lb. drums (drums $15.00)	.09 per lb.
300 lb. drums (drums $ 8.00)	.09 " "
55 lb. drums (drums $6.00)	.11 per lb.
27 lb. drums (drums $4.00)	.11 " "
100 lbs. 1c per lb. less.	
5 lb. cans	.27 per lb.
1 lb. cans	.33 " "
½ lb. cans	.43 " "
¼ lb. cans	.57 " "

Gambier — The common grade closed at 7c lb., a slight increase from last month's quotation.

Glycerine — The market continues to reflect the large surplus stocks and potential manufacturing facilities. Dynamite grade went to 9¾c, saponification from 7c to 6½c, and soap lye to 5½c on June 4 and on the 17th C. P. grade was quoted at 11½c in drums a reduction of ½c. Further gradual reductions are thought to be quite likely at least for the next sixty days when some thought can again be given to moving supplies into jobbing channels preparatory to the anti-freeze demand.

Lead — The market in this basic commodity did an about face during the month and prices firmed up considerably the closing quotation being based on 4.40 N. Y. as against 3.75 last month. This rise was mainly brought about by a reduction in production figures for May. World output of lead in May came to 123,339 short tons, smallest monthly output in several years and comparing with 131,926 tons in April, 145,489 in March and 157,270 in May, 1930, according to American Bureau of Metal Statistics. Average daily output for May was 3,979 tons compared with 4,398 in April, 4,693 in March and 5,073 tons in May, 1930. Following table gives in short tons lead output of the world accredited so far as possible to country of origin:

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Magnesium								
Magnesium Carb, tech, 70 lb bags NY...lb.	06	06½	.06	.06½	.06½	.06	.06½	.06
Chloride flake, 375 lb. drs c-l wks...ton	.....	36.00	.....	36.00	36.00	36.00	36.00	36.00
Imported shipment...ton	31.75	33.00	31.75	33.00	33.00	31.75	33.00	33.00
Fused, imp, 900 lb bbls NY ton	.....	31.00	.....	31.00	31.00	31.00	31.00	31.00
Fluosilicate, crys, 400 lb bbls wks...lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.10
Oxide, USP, light, 100 lb bbls...lb.	.....	.42	.....	.42	.42	.42	.42	.42
Heavy, 250 lb bbls...lb.	.....	.50	.....	.50	.50	.50	.50	.50
Peroxide, 100 lb cs...lb.	1.00	1.25	1.00	1.25	1.25	1.00	1.25	1.00
Silicofluoride, bbls...lb.	.09¾	.10¼	.09¾	.10¼	.10¼	.09¾	.10¼	.09¾
Stearate, bbls...lb.	.24	.26	.24	.26	.26	.25	.26	.25
Manganese Borate, 30%, 200 lb bbls...lb.	.....	.19	.....	.19	.19	.19	.24	.19
Chloride, 600 lb casks...lb.	.07½	.08½	.07½	.08½	.08½	.07½	.08½	.08
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.06	.03½	.06	.04½
Ore, Powdered or granular.. 75-80%, bbls...lb.	.02½	.03	.02½	.03	.03	.02½	.03½	.02½
80-85%, bbls...lb.	.....	.03½	.....	.03½	.03½	.03½	.04½	.03½
85-88%, bbls...lb.	.04	.04½	.04	.04½	.04½	.04	.05½	.04
Sulfate, 550 lb drs NY...lb.	.07	.08	.07	.08	.08	.07	.08½	.07
Mangrove 55%, 400 lb bbls...lb.	.....	.04	.03½	.04	Nom.	.03½	Nom.	.03½
Bark, African...ton	.....	27.00	25.50	29.75	33.00	29.75	35.00	30.00
Marble Flour, bulk...ton	14.00	15.00	14.00	15.00	15.00	14.00	15.00	14.00
Mercurous chloride...lb.	1.30	1.35	1.30	2.05	2.05	2.05	2.05	2.05
Mercury metal...76 lb flask	96.00	102.00	96.00	106.00	124.50	106.00	126.00	120.00
Meta-nitro-aniline...lb.	.67	.69	.67	.69	.69	.67	.74	.67
Meta-nitro-para-toluidine 200 lb. bbls...lb.	1.40	1.55	1.40	1.55	1.55	1.50	1.55	1.50
Meta-phenylene-diamine 300 lb. bbls...lb.	.80	.84	.80	.84	.84	.80	.90	.80
Meta-toluene-diamine, 300 lb bbls...lb.	.67	.69	.67	.69	.69	.67	.72	.67
Methanol								
Methanol, (Wood Alcohol),.... 95%...gal.	.33	.35	.33	.37	.48	.35	.65	.51
97%...gal.	.34	.39	.34	.43	.49	.39	.65	.53
Pure, Synthetic drums cars gal.	.39½	.41½	.39½	.42½	.50	.42½	.68	.53
Synthetic tanks...gal.	.....	.35½	.35½	.40½	.50	.40½	.66	.54
Methyl Acetate, drums...gal.	.. ..	Nom.	.....	Nom.	Nom.	Nom.	.95	.95
Acetone,...gal.	.50	.55	50	.70	.77	.65	.85	.73
Anthraquinone,...lb.	.85	.95	.85	.95	.85	.70	.95	.85
Cellosolve, (See Ethylene Glycol Monc Methyl Ether)	.....	.....	.....	.....	.....	.....	.....	....
Chloride, 90 lb cyl...lb.	.45	.45	.45	.45	.45	.45	.60	.45
Furoate, tech., 50 gal. dr., .lb.	.....	.50	.....	.50	.50	.50	.50	.50
Mica, dry grd. bags wks...lb.	65.00	80.00	65.00	80.00	80.00	65.00	80.00	65.00
Wet, ground, bags wks...lb.	110.00	115.00	110.00	115.00	115.00	110.00	115.00	110.00
Michler's Ketonc, kegs...lb.	.....	3.00	.....	3.00	3.00	3.00	3.00	3.00
Monochlorobenzene, drums see, Chorobenzene, mono...lb.								
Monomethylparaminosufate 100 lb drums...lb.	3.75	4.00	3.75	4.00	4.00	3.75	4.20	3.75
Montan Wax, crude, bags...lb.	.05½	.07	.05½	.07	.07	.06	.07	.06½
Myrobalans 25%, liq bbls...b	.03¾	.04¼	.03¾	.04¼	.04¼	.03¾	.04¼	.03¾
50% Solid, 50 lb boxes...lb.	.05	.05½	.05	.05½	.05½	.05	.08½	.05
J1 bags...ton	34.00	35.00	34.00	35.00	41.00	34.00	43.00	40.00
J 2 bags...ton	19.50	20.00	19.00	22.50	26.50	19.75	40.00	26.50
R 2 bags...ton	18.25	18.50	18.75	20.00	27.50	19.00	34.00	27.50
Naphtha, v. m. & p. (deodorized) bbls...gal.	.14	.16	.14	.18	.16	.16	.18	.16
Naphthalene balls, 250 lb bbls wks...lb.	.03¾	.04¾	.03¾	.04¾	.05½	.03¾	.05½	.05½
Crushed, chipped bgs wks..lb.	.....	.04	.....	.04	.04½	.04	.04½	.04½
Flakes, 175 lb bbls wks...lb.	.....	.03¾	.....	.03¾	.05	.03¾	.05	.05
Nickel Chloride, bbls kegs...lb.	.18	.20	.18	.21	.21	.20	.24	.20
Oxide, 100 lb kegs NY...lb.	.37	.40	.37	.40	.40	.37	.40	.37
Salt bbl. 400 bbls lb NY...lb.	.10½	.13	.10½	.13	.13	.10½	.13	.13
Single, 400 lb bbls NY...lb.	.10½	.12	.10½	.12	.13	.10½	.13	.13
Metal ingot...lb.	.35	.35	.35	.....	.....	.....	.....	.....
Nicotine, free 40%, 8 lb tins, cases...lb.	1.25	1.30	1.25	1.30	1.30	1.25	1.30	1.25
Sulfate, 10 lb tins...lb.	.98½	1.20	.98½	1.20	1.20	.98½	1.20	.98½
Nitre Cake, bulk...ton	12.00	14.00	12.00	14.00	18.00	12.00	18.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks...lb.	.09	.09½	.09	.09½	.09½	.09	.10½	.09
Nitrocellulose, c-l-l-cl, wks...lb.	.25	.36	.25	.36	.36	.25	.36	.25
Nitrogenous Material, bulk..unit	1.75	2.00	1.75	2.70	3.40	2.50	4.00	3.40
Nitronaphthalene, 550 lb bbls.lb.	.....	.25	.....	.25	.25	.25	.25	.25
Nitrotoluene, 1000 lb drs wks.lb.	.14	.15	.14	.15	.15	.14	.15	.14
Nutgalls Aleppy, bags...lb.	.16	.16½	.16	.16½	.16½	.16	.16½	.16
Chinese, bags...lb.	.12	.13	.12	.13	.13	.12	.13	.12
Oak Bark, ground...ton	30.00	35.00	30.00	35.00	35.00	30.00	50.00	30.00
Whole...ton	20.00	23.00	20.00	23.00	23.00	20.00	23.00	20.00
Orange-Mineral, 1100 lb casks NY...lb.	.11¾	.13	.11¾	.13	.13	.11¾	.13½	.11¾
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2.25	2.15	2.25	2.15
Orthoanisidine, 100 lb drs...lb.	2.50	2.60	2.50	2.60	2.60	2.50	2.60	2.50
Orthochlorophenol, drums...lb.	.50	.65	.50	.65	.65	.50	.65	.50
Orthocresol, drums...lb.	.25	.25	.25	.25	.35	.18	.28	.18
Orthodichlorobenzene, 1000 lb drums...lb.	.07	.10	.07	.10	.10	.07	.10	.07
Orthonitrochlorobenzene, 1200 lb drs wks...lb.	.30	.33	.30	.33	.33	.30	.33	.30
Orthonitrotoluene, 1000 lb drs wk...lb.	.16	.18	.16	.18	.18	.16	.18	.16
Orthonitrophenol, 350 lb dr...lb.	.85	.90	.85	.90	.90	.85	.90	.85
Orthotoluidine, 350 lb bbl 1c-1 lb.	.28	30	.25	.30	.30	.25	.30	.25

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

	March	*April*	*May*
United States	41,775	35,498	39,519
Canada	12,659	13,336	11,345
Mexico	24,801	22,207	18,426
Peru	......	......	......
Germany	11,112	8,591	7,918
Italy	2,244	2,136	2,302
*Spain & Tunis	10,014	9,253	7,102
†Europe, other	17,600	17,500	15,700
Australia	16,412	14,533	13,129
Burma	7,672	7,672	6,698.
†Elsewhere	1,200	1,200	1,200
World's total	145,489	131,926	123,339
United States	41,775	35,498	39,519
Elsewhere	103,714	96,428	83,820

*Partial. †Estimated or partly estimated.

Myrrh — This gum proved to be one of the exceptions in the gum market and an increase of 1c was made on June 15, the new price being quoted at 19c.

Methanol — On June 18 producers of synthetic-pure placed in effect a further reduction, the second in two months, the new price being based on 35½c in tanks and 2c more in drums. This represents a reduction of 2c in each case. Production of synthetic methanol during April amounted to 785,164 gallons, against 732, 233 gallons in March. Production for the four months ended with April was 2,949, 685 gallons, compared with 2,080,618 gallons during the same period last year, according to the Bureau of the Census. Shipments of synthetic during April were 397,901 gallons, against 490,795 gallons during March; and for the four months, 1,802,049 gallons, compared with shipments of of 1,805,291 gallons during the same time in 1930. Stocks at the end of the month, 2,243,676 gallons, against 1,856,413 gallons at the close of March, and 795,434 gallons at the end of April, 1930. Production of refined methanol from wood distillation during April was 211,073 gallons, against 253,494 in March and 524,295 gallons during April, 1930. For the four months, 994,084 gallons, against 1,656,222 gallons during the similar period last year. Shipments for the four months, 729,889 gallons, against 1,689,431 gallons last year. April shipments were the smallest in years at 141,801 gallons. Stocks at the end of April, 569,250 gallons, against 499,978 gallons at the end of March, and 430,213 at the end of April last year.

Phenol — Sales to all consuming lines other than the pharmaceutical were light for this period. Prices however, were well maintained.

Phenolphthalein — A reduction of 20c per lb. was announced on June 25, the new schedule calling for 80c in kegs with special packings in the usual proportion of increase.

Potash — Sales based on the new price schedule as announced last month in Chemical Markets were reported in satis-

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.75	.70	.75	.70
Osage Orange, crystals ....lb.	.16	.17	.16	.17	.17	.16	.17	.16
51 deg. liquid ....lb.	.07	.07½	.07	.07½	.07½	.07	.07½	.07
Powdered, 100 lb bags ....lb.	.14½	.15	.14½	.15	.15	.14½	.15	.14½
Paraffin, refd, 200 lb cs slabs								
123-127 deg. M. P. ....lb.	.....	.03	.03¼	.03	.04¾	.03½	.06¾	.04½
128-132 deg. M. P. ....lb.	.....	.03½	.03¼	.03½	.06¾	.03½	.07	.04¾
133-137 deg. M. P. ....lb	.....	.04¼	.04¾	.04¼	.07¼	.04¾	.07¾	.06½
Para Aldehyde, 110-55 gal drs..lb.	.20½	.23	.20½	.23	.23	.20½	.28	.20½
Aminoacetanilid, 100 lb bg. .lb	.52	.60	.52	.60	1.05	.52	1.05	1.00
Aminohydrochloride, 100 lb kegs ....lb	1.25	1.30	1.25	1.30	1.30	1.25	1.30	1.25
Aminophenol, 100 lb kegs ..lb.	.82	.84	.82	.86	1.02	.92	1.15	.99
Chlorophenol, drums ....lb.	.50	.65	.50	.65	.65	.50	.65	.50
Coumarone, 330 lb drums. lb.	.....	.....	.....	.....	.....	.....	.....	.....
Cymene, refd, 110 gal dr ..gal.	2.25	2.50	2.25	2.50	2.50	2.25	2.50	2.25
Dichlorobenzene, 150 lb bbls wks ....lb.	.15½	.16	.15½	.20	.20	.17	.20	.17
Nitroacetanilid, 300 lb bbls .lb.	.50	.55	.50	.55	.55	.50	.55	.50
Nitroaniline, 300 lb bbls wks ....lb.	.48	.55	.48	.55	.55	.48	.55	.48
Nitrochlorobenzene, 1200 lb drs wks ....lb.	.23	26	.23	.26	.26	.23	.26	23
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.85	2.75	2.85	2.75
Nitrophenol 185 lb bbls ....lb.	.45	50	.45	.50	.50	.45	.55	.45
Nitrosodimethylaniline, 120 lb. bbls ....lb.	.92	.94	.92	.94	.94	.92	.94	.92
Nitrotoluene, 350 lb bbls ....lb.	.29	.31	.29	.31	.31	.29	.31	.29
Phenylenediamine, 350 lb bbls ....lb.	1.15	1.20	1.15	1.20	1.20	1.15	1.20	1.15
Tolueneulfonamide, 175 lb bbls ....lb.	.70	.75	.70	.75	75	.70	.75	.70
Toluenesulfonchloride, 410 lb bbls wks ....lb.	.20	.22	.20	.22	.22	.20	.22	.20
Toluidine, 350 lb bbls wk ...lb.	.43	.44	.40	.44	.40	.38	.42	.38
Paris Green, Arsenic Basis								
100 lb kegs ....lb.	.....	.27	.....	.27	.27	.27	.27	25
250 lb kegs ....lb.	.....	.26	.25	26	.25	.25	.25	.23
Persian Berry Ext., bbls ....lb.	.25	Nom.	.25	Nom.	Nom.	.25	25	.25
Pentasol (see Alcohol, Amyl) ...								
Pentasol Acetate (see Amyl Acetate)								
Petrolatum, Green, 300 lb bbl.lb.	.02	.02½	.02	.02½	.02½	.02	.02½	.02
Phenol, 250-100 lb drums ....lb.	.14¾	.15	.14¾	.15	.15	.14¾	.16	.13
Phenyl-Alpha-Naphthylamine, 100 lb kegs ....lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	3.00	2.90		
Phosphate								
Phosphate Acid (see Superphosphate)								
Phosphate Rock, f.o.b. mines								
Florida Pebble, 68% basis ..ton	3.10	3.25	3.10	3.25	3.15	3.00	3.15	3.00
70% basis ....ton	3.75	3.90	3.75	3.90	4.00	3.75	4.00	3.50
72% basis ....ton	4.25	4.35	4.25	4.35	4.50	4.25	4.50	4.00
75-74% basis ....ton	5.25	5.50	5.25	5.50	5.50	5.25	5.50	5.00
75% basis ....ton	.....	5.75	.....	5.75	5.75	5.75	5.75	5.75
77-80% basis ....ton	.....	6.25	.....	6.25	6.25	6.25	6.25	6.25
Tennessee, 72% basis ....ton	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Phosphorous Oxychloride 175 lb cyl ....lb.	.18	.20	.18	.20	.25	.18	.40	.20
Red, 110 lb cases ....lb.	.37½	.42	.37½	.42	.42	.37½	.60	.37½
Yellow, 110 lb cases wks ..lb.	.31	.37½	.31	.37½	.37½	.31	.32	.31
Sesquisulfide, 100 lb cs ....lb.	.....	.44	.....	.44	.44	.44	.46	.44
Trichloride, cylinders ....lb.	.18	.20	.18	.20	.25	.18	.35	.20
Phthalic Anhydride, 100 lb bbls wks ....lb.	.15	.16	.15	.16	.20	.15	.20	.18
Pigments Metallic, Red or brown bags, bbls, Pa. wks ....ton	37.00	45.00	37.00	45.00	45.00	37.00	45.00	37.00
Pine Oil, 55 gal drums or bbls								
Destructive dist ....lb.	.63	.64	.63	.64	.64	.63	.64	.63
Prime bbls ....bbl.	8.00	10.60	8.00	10.60	10.60	8.00	10.60	8.00
Steam dist. bbls ....gal.	.54	.61	.54	.70	.70	.65	.70	.65
Pitch Hardwood, ... wks ....ton	35.00	45.00	35.00	45.00	45.00	35.00	45.00	40.00
Plaster Paris, tech, 250 lb bbls ....bbl.	3.30	3.50	3.30	3.50	3.50	3.30	3.50	3.30
Platinum, Refined ....oz.	27.00	28.00	27.00	28.00	....	.....	.....	.....
Potash								
Potash, Caustic, wks, solid ...lb.	.06½	.06¾	.06½	.06¾	.06¾	.06½	.07½	.06½
flake ....lb.	.0705	08	.0705	.08	.08	.0705	.07½	.0705
Potash Salts, Rough Kainit								
12.4% basis bulk ....ton	.....	9.20	.....	9.20	9.20	9.10	9.10	9.00
14% basis ....ton	.....	9.70	.....	9.70	9.70	9.60	9.60	9.50
Manure Salts								
20% basis bulk ....ton	.....	12.65	.....	12.65	12.65	12.50	12.50	12.40
30% basis bulk ....ton	.....	19.15	.....	19.15	19.15	18.95	18.95	18.75
Potassium Acetate ....lb.	.28	.30	.28	.30	.30	.27		
Potassium Muriate, 80% basis bags ....ton	.....	37.15	.....	37.15	37.15	36.75	36.75	36.40
Pot. & Mag. Sulfate, 48% basis bags ....ton	.....	27.80	.....	27.80	27.80	27.50	27.50	27.00
Potassium Sulfate, 90% basis bags ....ton	.....	48.25	.....	48.25	48.25	47.75	47.75	47.30
Potassium Bicarbonate, USP, 320 lb bbls ....lb.	.09½	.10	.09½	.10	.10	.09½	.14	.09½
Bichromate Crystals, 725 lb casks ....lb.	.08¾	.09½	.08¾	.09½	.09½	.08¾	.09½	.09
Powd., 725 lb cks wks ....lb.	.13	.13¼	.13	.13¼	.13½	.13	.13½	.13

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

factory tonnage. The German potash syndicate sold 1,214,052 metric tons K20 in the fertilizer year ended April 30, 1931, as compared with 1,402,666 tons in 1929-30. The decline amounts to188,000 tons K20. In the first four months of 1931, sales were 513,403 tons K20 against 656, 106 tons in the corresponding 1930 period. Sales in April (63,574 tons) were below expectations that were based on expected warmer weather.

Potassium Bichromate — A slightly lower rate of operation in the tanning industry curtailed shipments towards the latter part of the month, but the movement as a whole was reported as being satisfactory. Prices were unchanged.

Potassium Carbonate — A reduction of ¼c was announced on June 11 on the 80-85% calcined grade bringing the new level down to 5c while the hydrated was also quoted at lower figures.

Potassium Chlorate — The seasonal demand from the fireworks manufacturers slowed up gradually as the month closed. Demand from other consuming industries was just about normal.

Quicksilver — With the reduction of prices abroad due to lack of demand and mounting stocks quotations on this side showed decided weakness as the month wore on. Final quotations were around 99c a flask and it was thought that this could be bettered in some quarters.

Rosin — Prices were mixed during the past month, the grades B and D being higher, while the other grades were off considerably from closing prices in May. The rosin markets because of the huge stocks on hand were unable to participate in the general rise in commodity prices. The naval stores week ended June 25, found stores of gum spirits in Savannah, Jacksonville and Pensacola at 92,707 barrels, against 47,650 the previous year. The mean average of these stocks on June 25 for the years 1926 through 1930 was 49,000 barrels, thus it may be seen how far above the normal this year was. This was so in the face of receipts from April 1 through June 25 of 105,736 barrels, against 117,329 last year, and an average of 115,000 for the past four years. Rosin stocks on June 25 amounted to 424,772 barrels, against 299,105 last year and an average of 154,000 barrels on that date for the years 1926-30. Rosin receipts of 350,831 barrels for the period April 1-June 25 ran behind the 367,101 for last year.

Saltcake — With the paper industry still operating on a very reduced schedule producers and importers of saltcake were experiencing some difficulty in moving

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Binoxiate, 300 lb bbls......lb.	.14	.17	.14	.17	.17	.14	.17	.14
Bisulfate, 100 lb kegs......lb.	.....	.30	.....	.30	.30	.30	.30	.30
Carbonate, 80-85% calc. 800 lb casks..............lb.	.....	.05	.05	.05¾	.05¾	.05⅝	.05¾	.05⅝
Chlorate crystals, powder 112 lb keg wks............lb.	.08	.08½	.08	.08½	.09	.08	.09	.08½
Chloride, crys bbls.........lb.	.05½	.06	.05½	.06	.06	.05½	.05½	.05½
Chromate, kegs...........lb.	.23	.28	.23	.28	.28	.23	.28	.23
Cyanide, 110 lb. cases.....lb.	.55	.57½	.55	.57½	.57½	.55	.57½	.55
Metabisulfite, 300 lb. bbl...lb.	.12	.13	.12	.13	.13	.12	.13	.11
Oxalate, bbls.............lb.	.20	.24	.20	.24	.24	.20	.24	.16
Perchlorate, casks wks.....lb.	.11	.12	.11	.12	.12	.11	.12	.11
Permanganate, USP, crys 500 & 100 lb drs wks........lb.	.16	.16½	.16	.16½	.16½	.16	.16½	.16
Prussiate, red, 112 lb keg...lb.	.38	.40	.38	.40	.40	.38	.40	.38
Yellow, 500 lb casks.....lb.	.18½	.21	.18½	.21	.21	.18½	.21	.18½
Tartrate Neut, 100 lb keg..lb.	.....	.21	.....	.21	.21	.21	.51	.51
Titanium Oxalate, 200 lb bbls ....lb.	.21	.23	.21	.23	.23	.21	.25	.21
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	.....	5.00	5.00	5.00	5.00	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.05	.04	.05	.04
250 lb bbls.............lb.	.04½	.06	.04½	.06	.06	.04½	.06	.04½
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.03	02½	.03	.02½
Putty, commercial, tubs..100 lb.	.....	.03¼	.....	.03¼	.03¼	.03¼	.03¼	.03¼
Linseed Oil, kegs......100 lb.	.....	.05½	.....	.05½	.05½	.05½	.05½	.05½
Pyridine, 50 gal drums......gal.	1.50	1.75	1.50	1.75	1.75	1.50	1.75	1.50
Pyrites, Spanish cif Atlantic ports bulk.............unit	.13	.13¾	.13	.13¾	.13¾	.13	.13¾	.13
Quebracho, 35% liquid tks....lb.	.02¾	.04	.02¾	.04	.04	.02¾	.04	.03
450 lb bbls c-1..........lb.	.03¼	.03¾	.03¼	.03¾	.03¾	.03¼	.04½	.03½
35% Bleaching, 450 lb bbl .lb.	.04¼	.05¼	.04¼	.05¼	.04¼	.05¼	.04¼	.05¼
Solid, 63%, 100 lb bales cif..lb.	.05	.05½	.05	.05½	.05½	.05	.05¾	.05¼
Clarified, 64%, bales.....lb.	.....	.05⅜	.....	.05⅜	.05⅝	.05⅝	.05⅝	.05⅝
Quercitron, 51 deg liquid 450 lb bbls.................lb.	.05½	.06	.05½	.06	.06	.05½	.06	.05½
Solid, 100 lb boxes.........lb.	.09½	.13	.09½	.13	.13	.09½	.13	.10
Bark, Rough...........ton	.....	14.00	.....	14.00	14.00	14.00	14.00	14.00
Ground................ton	34.00	35.00	34.00	35.00	35.00	34.00	35.00	34.00
R Salt, 250 lb bbls wks......lb.	.40	.44	.40	.44	.45	.40	.46	.44
Red Sanders Wood, grd bbls..lb.	.....	.18	.....	.18	.18	.18	.18	.18
Resorcinol Tech, cans........lb.	.90	1.25	.90	1.25	1.25	.90	1.25	1.15
Rosin Oil, 50 gal bbls, first run ....gal.	.52	.56	.52	.58	.58	.56	.62	.57
Second run............gal.	.56	.58	.56	.61	.61	.59	.64	.60

Rosin

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Rosins 600 lb bbls 280 lb...unit ex. yard N. Y.								
B......................	.....	4.80	4.15	4.95	7.75	5.35	9.25	7.45
D......................	.....	5.25	4.60	5.50	8.00	5.50	9.25	7.70
E......................	.....	5.55	4.85	5.90	8.17	5.52½	9.27	8.30
F......................	.....	5.60	5.05	6.20	8.45	5.55	9.27	8.40
G......................	.....	5.62½	5.15	6.25	8.45	5.60	9.45	8.40
H......................	.....	5.65	5.20	6.30	8.55	5.60	9.50	8.40
I......................	.....	5.67½	5.25	6.35	8.58	5.62½	9.50	8.40
K......................	.....	5.80	5.40	6.45	8.65	5.62½	9.55	8.45
M......................	.....	6.40	5.65	6.70	8.80	5.65	9.85	8.50
N......................	.....	6.85	6.15	6.95	8.95	6.05	10.30	8.93
WG.....................	.....	8.40	7.65	8.15	9.25	6.85	11.30	9.00
WW.....................	.....	8.90	8.40	8.90	9.85	7.85	12.30	9.30
Rotten Stone, bags mines....ton	24.00	20.00	24.00	20.00	30.00	18.00	30.00	24.00
Lump, imported, bbls......lb.	.05	.07	.05	.07	.07	.05	.08	.05
Selected bbls............lb.	.09	.12	.09	.12	.12	.09	.12	.09
Powdered, bbls...........lb.	.02	.05	.02	.05	.05	.02	.05	.02
Sago Flour, 150 lb bags......lb.	.04½	.05	.04½	.05	.05	.04½	.05	.04½
Sal Soda, bbls wks.......100 lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Salt Cake, 94-96% c-1 wks..ton	15.50	19.00	15.50	19.00	24.00	15.50	24.00	19.00
Chrome ....ton	14.50	17.00	14.50	17.00	25.00	14.50	21.00	12.00
Saltpetre, double refd granular 450-500 lb bbls.........lb.	.06	.06¾	.06	.06¾	.06¾	.06½	.06½	.06⅛
Satin, White, 500 lb bbls.....lb	.....	.01½	.....	.01½	.01½	.01⅛	.01½	.01½
Shellac Bone dry bbls........lb.	.28	.30	.28	.29	.47	.28	.61	.47
Garnet, bags..............lb.	.20	.22	.20	.26	.40	.24	.45	.40
Superfine, bags...........lb.	.....	.17½	.17½	.22	.39	.20	.47	.39
T. N. bags...............lb.	.16	.16½	.16	.17	.34	.18	.44	.36
Schaeffer's Salt, kegs.........lb.	.53	.57	.53	.57	.57	.53	.57	.53
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	11.00	8.00	11.00	8.00
Refined, floated bags......ton	22.00	30.00	22.00	30.00	30.00	22.00	30.00	22.00
Air floated bags.........ton	.....	32.00	.....	32.00	32.00	32.00	32.00	32.00
Extra floated bags......ton	32.00	40.00	32.00	40.00	40.00	32.00	40.00	32.00
Soapstone, Powdered, bags f. o. b. mines.................ton	15.00	22.00	15.00	22.00	22.00	15.00	22.00	15.00

Soda

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Soda Ash, 58% dense, bags c-1 wks................100 lb.	.....	1.17½	.....	1.17½	1.40	1.40	1.40	1.40
58% light, bags.......100 lb.	.....	1.15	.....	1.15	1.34½	1.34½	1.34½	1.34½
Contract, bags c-1 wks.100 lb.	.....	1.15	1.15	1.15	1.32	1.32	1.32	1.32
Soda Caustic, 76% grnd & flake drums.............100 lb.	.....	2.90	.....	2.90	3.35	3.00	3.35	3.35
76% solid drs.........100 lb.	.....	2.50	.....	2.50	2.95	2.90	2.95	2.95
Sodium Acetate, tech....450 lb. bbls wks...............lb.	.....	.05	.04½	.05	.05½	.04	.06¾	.04¾
Arsenate, drums..........lb.	.18	.19	.18	.19	.19	.18	.19	.18
Arsenite, drums..........gal.	.50	.75	.50	.75	1.00	.50	1.50	.75
Bicarb, 400 lb bbl NY..100 lb.	.....	2.35	2.35	2.35	2.41	2.41	2.41	2.41

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

present stocks and a reduction of $1 a ton was made in an effort to stimulate the movement of material.

Shellac — The decided upward swing experienced in the shellac market two months ago has almost entirely disappeared and prices sagged during June to within sight of the low prices of 1931. Demand was negligible and no forward buying was to be found. Buyers are evidently covered for immediate requirements for the next thirty to sixty days and are preferring to await future developments before assuming obligations at present contract prices.

Soda Ash — Prices were well maintained at established levels despite very light demand from most consuming channels. Little improvement in tonnage is expected until the middle of August.

Soda Caustic — Only in the soap industry was there any noticeable increase in tonnages in June over May. Prices were being well maintained and spot sales were going through at the less than carlot schedules.

Sodium Bichromate — Shipments in June were thought to be equal to if not slightly better than May. Some slowing up in both the tanning and textile centers was reported. Prices remain firm and unchanged.

Sodium Phosphate — Demand for the tri-salt was favorable, but curtailed operations in the silk-weighting centers effected a reduction in shipments of di soda. No improvement was in evidence in the price structure, the competitive condition of the past six months holding prices to low levels. However, no fresh shading of prices occurred during the past month and hope was expressed in several quarters that the situation might at least stabilize at existing levels. With production capacities in excess of demand it is unlikely that any improvement can be looked for for some time.

Sodium Stannate — Reflecting the rise in tin quotations the sodium salt was advanced on July 1 to 20-24c.

Tankage — This commodity moved into new low ground when the ground per unit was quoted at $1.75, dried blood at $1.70, and unground tankage, $1.60. Continued indifference on the part of mixers to buying ahead and with the mixing season practically at a close stocks were heavier, resulting in the low prices quoted.

Tin Oxide — In sympathy with the higher price for the metal, the manufacturers of the oxide placed in effect a ¾ of a cent increase as of June 14.

Tin Salts — The higher price for the metal was felt at the close of the month

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Bichromate, 500 lb cks wks.lb.	.07	.07½	.07	.07½	.07½	.07	.07¾	.07
Bisulfite, 500 lb bbl wks....lb.	.....	.04	.....	.04	.04	.04	.04	.04
Carb. 400 lb bbls NY..100 lb.	.....	2.30	.....	2.30	2.30	2.30	1.35	1.30
Chlorate, ... wks..lb.	.05¾	.07¾	.05¾	.07¾	.08	.05¾	.11	.06½
Chloride, technical........ton	12.00	13.00	12.00	13.00	13.00	12.00	13.00	12.00
Cyanide, 96-98%, 100 & 250 lb drums wks..........lb.	.16	.17	.16	.17	.20	.16	.20	.18
Fluoride, 300 lb bbls wks...lb.	.07½	.08½	.07½	.08½	.09	.08¼	.09	.08½
Hydrosulfite, 200 lb bbls f. o. b. wks.................lb.	.22	.24	.22	.24	.24	.22	.24	.22
Hypochloride solution, 100 lb cbys.................lb.	.....	.05	.....	.05	.05	.05	.05	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks......100 lb.	2.40	3.00	2.40	3.00	3.00	2.40	3.05	2.50
Technical, regular crystals 375 lb bbls wks....100 lb.	2.50	2.65	2.50	2.65	2.65	2.50	2.65	2.40
Metanilate, 150 lb bbls.... lb.	.44	.45	.44	.45	.45	.44	.45	.45
Monohydrate, bbls........lb.	.....	.02½	.....	.02½	.02½	.02½	.02½	.02½
Naphthionate, 300 lb bbl...lb.	.52	.54	.52	.54	.57	.52	.57	.54
Nitrate, 92%, crude, 200 lb bags c-1 NY......100 lb.	.....	2.05	2.02	2.07	2.22½	1.99	2.22½	2.09
Nitrite, 500 lb bbls spot....lb.	.07¼	.08	.07¼	.08	.08	.07¼	.08	.07½
Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb.	.25	.27	.25	.27	.27	.25	.27	.25
Oxalate Neut, 100 lb kegs..lb.	.37	.42	.37	.42	.42	.37	.42	.37
Perborate, 275 lb bbls.....lb.	.18	.20	.18	.20	.20	.18	.22	.18
Phosphate, di-sodium, tech. 310 lb bbls.......100 lb.	2.50	3.00	2.50	3.00	3.25	2.65	3.55	3.25
tri-sodium, tech, 325 lb bbls...............100 lb.	3.15	3.50	3.15	3.50	4.00	3.25	4.00	3.90
Picramate, 100 lb kegs.....lb.	.69	.72	.69	.72	.72	.69	.72	.69
Prussiate, Yellow, 350 lb bbl wks.................lb.	.11½	.12	.11½	.12	12½	.11½	.12½	.12
Pyrophosphate, 100 lb keg..lb.	.15	.20	.15	.20	.20	.15	.20	.15
Silicate, 60 deg 55 gal drs, wks ....100 lb.	.....	1.65	.....	1.65	1.65	1.65	1.65	1.65
40 deg 55 gal drs, wks ....100 lb.	.75	1.00	.75	1.00	.80	.70	.80	.70
Silicofluoride, 450 lb bbls NY ....lb.	.....	.04½	.04	.04¾	.05½	.04	.05½	.05
Stannate, 100 lb drums....lb.	.....	.20½	.19½	.26	.43	.24	.43	.38
Stearate, bbls............lb.	.20	.25	.20	.25	.29	.20	.29	.25
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.18	.16	.18	.16
Sulfate Anhyd, 550 lb bbls c-1 wks.............lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02½
Sulfide, 80% crystals, 440 lb bbls wks............lb.	.02½	.02¾	.02½	.02¾	.02¾	.02½	.02¾	.02½
62% solid, 650 lb drums lc-1 wks............lb.	.03	.03¼	.03	.03¼	.03¼	.03	.04	.03¼
Sulfite, crystals, 400 lb bbls wks................lb.	.03	.03½	.03	.03½	.03½	.03	.03½	.03
Sulfocyanide, bbls........lb.	.28	.35	.28	.35	.35	.28	.76	.28¾
Tungstate, tech, crystals, kegs ....lb.	.81	.88	.81	.88	.88	.81	1.40	.88
Solvent Naphtha, 110 gal drs wks................gal.	.30	.38	.30	.38	.40	.30	.40	.35
Spruce, 25% liquid, bbls.....lb.	.....	.01⅜	.....	.01⅜	.01⅜	.01⅜	.01⅜	.01⅜
25% liquid, tanks wks.....lb.	.....	.01	.....	.01	.01	.01	.01	.01
50% powd, 100 lb bag wks lb.	.02	.02¼	.02	.02¼	.02¼	.02	.02¼	.02
Starch, powd., 140 lb bags ....100 lb.	.....	2.57	2.57	3.20	4.02	3.42	4.12	3.82
Pearl, 140 lb bags.....100 lb.	.....	2.77	2.77	3.00	3.92	3.32	4.02	3.72
Potato, 200 lb bags........lb.	.05½	.06	.05½	.06	.06½	.05½	.06¾	.05¾
Imported bags..........lb.	.05¾	.06½	.05¾	.06½	.06½	.05¾	.06¾	.05¾
Soluble................lb.	.08	.08½	.08	.08½	.08½	.08	.08½	08
Rice, 200 lb bbls.........lb.	.09	.10	.09	.10	.10	.09	.10	.09½
Wheat, thick bags.........lb.	.06½	.07	.06½	.07	.07	.06½	.07	.06½
Thin bags..............lb.	.09½	.10	.09½	.10	.10	.09½	.10	.09½
Strontium carbonate, 600 lb bbls wks...................lb.	.07½	.07½	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY....lb.	.09	.09½	.09	.09½	.09½	.09	.09½	.08¾
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25

Sulfur

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Sulfur Brimstone, broken rock, 250 lb bag c-1.......100 lb.	.....	2.05	.....	2.05	2.05	2.05	2.05	2.05
Crude, f. o. b. mines......ton	18.00	19.00	18.00	19.00	19.00	18.00	19.00	18.00
Flour for dusting 99½%, 100 lb bags c-1 NY....100 lb.	.....	2.40	.....	2.40	2.40	2.40	2.40	2.40
Heavy bags c-1......100 lb.	.....	2.50	.....	2.50	2.50	2.50	2.50	2.50
Flowers, 100%, 155 lb bbls c-1 NY..............100 lb.	.....	3.45	.....	3.45	3.45	3.45	3.45	3.45
Roll, bbls lc-1 NY.....100 lb.	2.65	2.85	2.65	2.85	2.85	2.65	2.85	2.65
Sulfur Chloride, red, 700 lb drs wks...................lb.	.05	.05½	.05	.05½	.05½	.05	.05½	.05
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.04½	.03½	.04½	.03½
Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.07	.07½	.07½	.07	.08½	.07
Extra, dry, 100 lb cyl......lb.	.10	.12	.10	.12	.12	.10	.19	.10
Sulfuryl Chloride,.......... ..lb.	.15	.40	.15	.40	.65	.10	.65	.10
Talc, Crude, 100 lb bgs NY...ton	12.00	15.00	12.00	15.00	15.00	12.00	15.00	12.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	18.00	16.00	18.00	16.00
French, 220 lb bags NY...ton	18.00	22.00	18.00	22.00	22.00	18.00	25.00	18.00
Refined, white, bags....ton	35.00	40.00	35.00	40.00	40.00	35.00	45.00	35.00
Italian, 220 lb bags NY...ton	40.00	50.00	40.00	50.00	50.00	40.00	50.00	40.00
Refined, white, bags....ton	50.00	55.00	50.00	55.00	55.00	50.00	55.00	50.00
Superphosphate, 16% bulk, wks.................... ton	8.00	9.00	8.00	9.00	9.50	8.00	10.00	9.00
Triple bulk, wks.........unit	.....	.65	.....	.65	.65	.65	.....	.....
Tankage Ground NY.......unit	.....	1.75&10	1.75	3.20&10	4.00&10	3.20&10	4.50&10	4.00&10
High grade f.o.b. Chicago.unit	.....	1.50&10	1.50	3.25&10	3.85&10	3.25&10	4.80&10	3.75&10
South American cif.......unit	.....	2.45&10	2.45	3.40&10	4.25&10	3.40&10	4 80&10	4.35&10
Tapioca Flour, high grade bgs.lb.	.03½	.05	.03½	.05	.05¾	.03	.05¾	.04½
Medium grade, bags.....lb.	.03	.04	.03	.04	.04¾	.02½	.04¾	.03¾
Tar Acid Oil, 15%,drums....gal.	.24	.25	.24	.25	.27	.24	.27	.26
25% drums............gal.	.26	.28	.26	.28	.30	.26	.30	.29

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

when producers of crystals and the anhydrous tetrachloride increased prices. Crystals were quoted at 25-25½c while the anhydrous was quoted at 18¼c. While silk weighting operations have been curtailed they are still operating in the Paterson and Passaic districts at a fairly steady rate.

Turpentine — The market in this commodity slumped off badly during June and carlot prices went to as low, in most cases, as 50c ex dock. Stocks continue to pile up at southern shipping points and despite last minute efforts to stabilize conditions the market continued distinctly bearish.

OILS AND FATS

Chinawood Oil — Improved mental conditions about the immediate future course of business acted as a stimulus and as the month closed prices were firmer than for some time past. The prevailing quotation was reported as being 5½c in tanks Pacific Coast. The May export of tung oil from Hankow has been greatly stimulated by an upward revision of the Chinese export duty on that product. The export duty, which will become effective June 1, is reported to be 1.58 Haikwan taels per picul, replacing the former duty of 0.30 Haikwan tael per picul. The activity of the market is causing rapid depletion of Hankow stocks. Since the Haikwan tael is not a stationary unit, but fluctuates rather closely with the changes in the price of silver, the present conversion of the duty assessed can not be accurately determined. The exchange quotation of the Haikwan tael has ranged during 1931 from $0.3268 to $0.3560. Shipments from Hong Kong during the first three months of 1931 amounted to 1,162,900 pounds, valued at $55,050, of which 260,000 pounds were declared in January 503,000 pounds in February, and 399,900 pounds in March. A partial clarification of the military situation in Kwangsi in February resulted in a greater movement of oil from the interior during that month, although shipments during March were difficult. A tabulation showing the destination of shipments during the first quarter is presented below: United States, 667,300 pounds; Germany, 123,900; Straits Settlements 55,700; Japan, 52,700; Netherlands, 45,500; United Kingdom, 45,000; other countries, 172,800.

Cocoanut Oil — While quotations did not change materially the tone of the market at the close of the month was better and in some quarters it was thought

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Terra Alba Amer. No. 1, bgs or bbls mills.........100lb.	1.15	1.75	1.15	1.75	1.75	1.15	1.75	1.15
No. 2 bags or bbls...100lb.	1.50	2.00	1.50	2.00	2.00	1.50	2.00	1.50½
Imported bags............lb.	.01⅛	.01¼	.01⅛	.01¼	.01¼	.01⅛	.02¼	.01
Tetrachlorethane, 50 gal dr...lb.	.09	.09½	.09	.09½	.09½	.09	.09½	.09
Tetralene, 50 gal drs wks.....lb.	.....	.20	.....	.20	.20	.20	.20	.20
Thiocarbanilid, 170 lb bbl....lb.	.26½	.28½	.26½	.28½	.28½	.22	.24	.22
Tin Bichloride, 50% soln, 100 lb bbls wks...............lb.	.....	.12¾	.....	.12¾	.12¾	.12¾	.14¾	.13½
Crystals, 500 lb bbls wks...lb.	.....	.25	.24	.28½	.34	.25	.38	.33
Metal Straits NY.........lb.	.....	.25	.22½	.27	.38	.26	.48	.39
Oxide, 300 lb bbls wks.....lb.	.25	.29	.25	.29	.42	.25	.56	.42
Tetrachloride, 100 lb drs wks. ....lb.	.....	.18¼	.17¼	.19½	.20½	.18¼	.30½	.27¼
Titanium Dioxide 300 lb bbl..lb	.21	.22	.21	.22	.50	.21	.50	.22
Pigment, bbls...........lb.	.06½	.07¾	.06½	.07¾	.07¾	.06½	.14	.07¼
Toluene, 110 gal drs........gal.	.....	.34	.....	.34	.40	.35	.45	.45
8000 gal tank cars wks....gal.	.28	.30	.28	.30	.35	.30	.40	.40
Toluidine, 350 lb bbls........lb.	.88	.89	.88	.94	.94	.90	.94	.90
Mixed, 900 lb drs wks......lb.	.27	.32	.27	.32	.32	.27	.32	.31
Toner Lithol, red, bbls.......lb.	.90	.95	.90	.95	.95	.90	.95	.85
Para, red, bbls............lb.	.....	.80	.....	.80	.80	.80	.80	.70
Toluidine ....lb.	1.50	1.55	1.50	1.55	1.55	1.50	1.55	1.50
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.36	.32	.36	.32
Trichlorethylene, 50 gal dr...lb.	.10	.10½	.10	.10½	.10½	.10	.10½	.10
Triethanolamine, 50 gal drs...lb.	.40	.42	.40	.42	.42	.40	.60	.55
Tricresyl Phosphate, drs.....lb.	.33	.45	.33	.45	.45	.33	.45	.33
Triphenyl guanidine.........lb.	.58	.60	.58	.60	.60	.58	.70	.58
Phosphate, drums.........lb.	.60	.70	.60	.70	.70	.60	.75	.60
Tripoli, 500 lb bbls......100 lb.	.75	2.00	.75	2.00	2.00	1.75	2.00	1.75
Tungsten, Wolframite,..per unit	11.25	11.75	11.25	11.75	.....	.....	.....	.....
Turpentine carlots, bbls.....gal.	.50	.51	.50	.57	.61¼	.41	.65	.51½
Wood Steam dist. bbls....gal.	.51	.61	.47	.61	.52	.36	.57	.49
Urea, pure, 112 lb cases......lb	.15	.17	.15	.17	.17	.15	.30	.15
Fert. grade, bags c.i.f.....ton	....	108.00	.....	108.00	108.00	108.00	105.00	98.00
c. i. f. S. points.........ton	.....	109.30	.....	109.30	109.30	109.30	106.30	99.30
Valonia Beard, 42%, tannin bags...................ton	.....	40.00	.....	40.00	40.00	39.50	55.00	42.00
Cups, 30-31% tannin.....ton	24.00	25.00	24.00	25.00	27.00	24.00	35.00	30.00
Mixture, bark, bags.......ton	30.00	31.00	30.00	31.00	32.50	30.00	43.00	35.00
Vermillion, English, kegs....lb..	1.75	1.80	1.75	1.80	2.05	1.75	2.05	2.00
Vinyl Chloride, 16 lb cyl.....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Wattle Bark, bags..........ton	36.25	37.00	36.25	41.00	47.75	40.00	49.75	43.50
Extract 55%, double bags ex-dock...................lb.	.05⅞	.06½	.05⅞	.06½	.06½	.05⅞	.06½	.06½
Whiting, 200 lb bags, c-1 wks ....100 lb.	.....	1.00	.....	1.00	1.00	1.00	1.25	1.00
Alba, bags c-1 NY........ton	.....	13.00	.....	13.00	13.00	13.00	13.00	13.00
Gilders, bags c-1 NY...100 lb.	.....	1.35	.....	1.35	1.35	1.35	1.35	1.35
Xylene, 10 deg tanks wks. .gal.	.....	.28	.....	.28	.31	.28	.33	.33
Commercial, tanks wks...gal.	.25	.30	.25	.30	.33	.25	.32	.30
Xylidine, crude.............lb.	.....	.37	.....	.37	.38	.37	.38	.38
Zinc								
Zinc Ammonium Chloride powd., 400 lb bbls......... 100 lb.	5.25	5.75	5.25	5.75	5.75	5.25	5.75	5.25
Carbonate Tech, bbls NY..lb.	.10½	.11	.10½	.11	.11	.10½	.11	.10½
Chloride Fused, 600 lb drs. wks....................lb.	.05¾	.06	.05¾	.06	.06	.05¾	.06	.05¾
Gran., 500 lb bbls wks.....lb.	.05⅝	.06	.05⅝	.06	.06½	.05⅝	.06½	.06¼
Soln 50%, tanks wks...100 lb.	2.25	3.00	2.25	3.00	3.00	2.25	3.00	3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.41	.38	.41	.40
Dithiofuroate, 100 lb dr....lb.	.....	1.00	.....	1.00	1.00	1.00	1.00	1.00
Dust, 500 lb bbls c-1 wks...lb.	.06	.07	.06	.07	.11	.06	.08¾	.08½
Metal, high grade slabs c-1 NY...............100 lb.	4.25	4.30	3.60	4.45	6.45	4.10	6.45	6.45⅜
Oxide, American bags wks..lb.	.06½	.07	.06½	.07	.07⅝	.06½	.07⅝	.07
French, 300 lb bbls wks...lb.	.09⅞	.11⅞	.09⅞	.11⅞	.11⅞	.09⅞	.11⅞	.09⅞
Perborate, 100 lb drs......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Peroxide, 100 lb drs.......lb.	.....	1.25	.....	1.25	1.25	1.25	1.25	1.25
Stearate, 50 lb bbls........lb.	.19	.22	.19	.23	.26	.20	.26	.25
Sulfate, 400 bbl wks.......lb.	.03	.03½	.03	.03½	.03½	.03	.03¾	.03
Sulfide, 500 lb bbls........lb.	.16	.16½	.16	.16½	.32	.16	.32	.30
Sulfocarbolate, 100 lb keg..lb.	.28	.30	.28	.30	.30	.28	.30	.28
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.03	.02½	.03	.02½
Pure kegs................lb.	.45	.50	.45	.50	.50	.45	.50	.45
Semi-refined kegs.........lb.	.08	.10	.08	.10	.10	.08	.10	.08

Oils and Fats

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Castor, No. 1, 400 lb bbls.....lb.	.11¼	.12	.11	.12	.13½	.11½	.13½	.13
No. 3, 400 lb bbls.........lb.	.10¼	.11	.10½	.11¾	.13	.11	.13	.12½
Blown, 400 lb bbls........lb.	.13¾	.14	.13¾	.14	.15	.12	.15	.14
China Wood, bbls spot NY...lb.	.07	.07½	.07	.07½	.13	.07	.16	.14½
Tanks, spot NY.........lb.	.....	.06½	.06	.07	.11⅜	.06	.15	.13½
Coast, tanks, ...lb.	.06	.06½	.05½	.06½	.10⅞	.05½	.14¼	.12⅜
Cocoanut, edible, bbls NY....lb.	.....	.10¾	.....	.10¾	.10¾	.10¾	.10¾	.10¾
Ceylon, 375 lb bbls NY....lb.	.06⅛	.06½	.06⅛	.06½	.08¼	.06⅝	.09½	.07⅞
8000 gal tanks NY......lb.	.04⅛	.05	.04⅛	.06	.07	.05½	.08⅝	.06⅝
Cochin, 375 lb bbls NY....lb.	.06¾	.07	.06¾	.07	.09¼	.07¼	.10	.09½
Tanks NY..............lb.	.05⅝	.05¾	.05⅝	.05¾	.08½	.07	.09½	.08⅝
Manila, bbls NY..........lb.	.06⅛	.07	.06⅛	.07	.08¼	.06½	.09½	.07⅞
Tanks NY..............lb.	.04¼	.05⅛	.04¼	.05⅛	.07⅛	.05⅜	.08⅞	.06⅞
Tanks, Pacific Coast.....lb.	.03⅞	.04	.03⅞	.05	.07	.05⅛	08	.06⅞

Prices Current and Comment

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1930 Average $1.161 - Jan. 1930 $1.072 - June 1931 $1.429

that a slight advance was quite probable. Shipments in June were slightly better than May while offerings were smaller.

Corn Oil — In sympathy with the rise in competing material producers advanced the price of crude at the mills as much as ⅜ of a cent.

Cottonseed Oil — This market reflected the improved sentiment prevailing generally in business and registered a few gains near the close of the month. Buying however is still very much a hand to mouth proposition.

Degras — Trading was very light. Prices remained firm however, and the market had an improved tone to it.

Linseed Oil — The market for this commodity moved forward upon reports of the rise in the flaxseed market. Prices closed the month at 8.6c per pound in carlots, barrels and 8c in tank-cars. Actual trading was along conservative lines with buyers limiting purchasing to small quantities, but entering the market more frequently. The flaxseed markets have shown consistent strength throughout the month at Minneapolis and Duluth. Both option prices and cash seed values were higher, in spite of unusually good receipts. Argentine prices were also higher, due to a decided improvement in the peso exchange and to the reluctance of Argentine provincial flax sellers to part with the remainder of their stocks at present levels. Reports of the condition of the growing Northwestern flax crops are somewhat conflicting. In North Dakota, which is the largest flax growing area in the U. S., the northwestern side of the state is in a critically bad condition due to drouth. The central part will need additional moisture very soon, and the eastern section is in fairly good shape. Minnesota flax growing conditions are good. South Dakota conditions have improved slightly. In Montana very little flax is being grown this year. One well known authority writes under date of June 15th that the flax acreage is reduced so much that only a small crop may be expected. One private estimate is that there will be a 10 to 15 per cent reduction in acreage compared with last year's harvested acreage of 3,946,000.

Oleo Oil — Demand from consuming channels improved during the last two weeks of the month.

Olive Oil — Denatured oil was in fair demand. The foots were quiet, but with prices steady.

Palm Oil — Offerings from primary markets were lighter than usual and this fact tended to firm up the markets in this country. Actual sales were small and for immediate consumption.

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Cod, Newfoundland, 50gal bbls ....gal.	.46	.48	.41	.48	.56	.46	.64	.57½
Tanks NY............gal.	.44	.45	.39	.45	.62	.48	.60	.60
Cod Liver see Chemicals........								
Copra, bags..............lb.	.0235	.0275	.0235	.0325	.046	.039	.05¼	.042
Corn, crude, bbls NY........lb.	.07	.09	07	.09	.10	.08½	.10¾	.09½
Tanks, mills...........lb.	.....	.06¼	.05½	.07½	.08	.06½	.09¾	.07⅞
Refined, 375 lb bbls NY....lb.	.10¼	.10½	.10¼	.10½	.10½	.09½	.11¾	.10¼
Tanks.................lb.	.08½	.08¾	.08¼	.08¾	.10	.08	.11	.09
Cottonseed, crude, mill......lb.	.06⅞	.07	.06⅛	.07	.07½	.06⅛	.09	.08⅛
PSY 100 lb bbls spot......lb.	.08	.09	.074	.09	.088	.076	.1075	.085
Mar .... lb.	...	.0748	.....	....	....	....	.....	....
Degras, American, 50 gal bbls NY..................lb.	.04½	.04½	.04	.04¼	.04¼	.03¼	.05	.03¼
English, brown, bbls NY....lb.	.04½	.05	.04¼	.05	.05	.04¼	.05⅝	.04¼
Light, bbls NY ....lb.	.05	.05½	.05	.05½	.05½	.05	.05¾	.05
Dog Fish, Coast Tanks.....gal.	.....	.32	.....	32	.34	.32		

Greases

	Current Market		1931 Low	1931 High	1930 High	1930 Low	1929 High	1929 Low
Greases, Brown.............lb.	.04⅛	.04¼	.03⅞	.04¼	.06½	.04	.08½	.06
Yellow...................lb.	.04½	.05	.03	.05	.07½	.03⅞	.08½	.06½
White, choice bbls NY.....lb	.04	.04½	.04	.05¾	.08½	.06	.11½	.07¾
Herring, Coast, Tanks......gal.	.....	Nom.	.....	Nom.	.....	.....		
Horse, bbls................lb.	.05¼	Nom.	.05¼	Nom.	Nom.	.05¼	Nom.	.....
Lard Oil, edible, prime.......lb.	.12½	.13	.12½	.13	.13⅝	.12½	.15¾	.14⅝
Extra, bbls..............lb.	.08½	.09	.08½	.10	.12	.10	.13½	.12
Extra No. 1, bbls........lb.	.07¾	.08	.07¾	.09¾	.11	.09¾	.13½	.11¾
Linseed, Raw, five bbl lots...lb.	.....	.093	.088	.102	.146	.096	.162	.105
Bbls c-1 spot...........lb.	.....	.091	.084	.098	.142	.092	.158	.101
Tanks...............lb.	.....	.083	.078	.092	.134	.086	.15	.093
Menhaden Tanks Baltimore.gal.	.21	.22	.21	.22	.50	.21	.52	.45
Extra, bleached, bbls NY..gal.	.47	.49	.52	.53	.70	.52	.70	.70
Light, pressed, bbls NY...gal.	.35	.36	.35	.38	.64	.36	.64	.63
Yellow, bleached, bbls NY.gal.	.38	.39	.38	.42	67	.38	.67	.66
Mineral Oil, white, 50 gal bbls ....gal.	.40	.60	.40	.60	.60	.40	.60	.40
Russian, gal.............gal.	.95	1.00	.95	1.00	1.00	.95	1.00	.95
Neatsfoot, CT, 20° bbls NY .lb.	.15	.16	.15	.16	.17⅜	.16¼	.19	.18¼
Extra, bbls NY...........lb	.08	.08½	.08	.10	.11⅛	.09½	.13½	.12
Pure, bbls NY............lb.	.10¼	.11	.10¼	.12	.13⅛	.11½	.15¼	.13½
Oleo, No. 1, bbls NY........lb.	.....	.06⅝	.06⅝	.08	.12½	.08⅞	.11½	.10¾
No. 2, bbls NY.......lb.	.....	.06¼	.06¼	.08	.11	.08⅛	.11½	.10
No. 3, bbls NY...........lb.	.....	.07⅞	.07⅞	.09	.10½	.09	.10½	.09¾
Olive, denatured, bbls NY...gal.	.82	.85	.82	.85	1.00	.70	1.40	1.05
Edible, bbls NY..........gal.	1.75	2.00	1.75	2.00	2.00	1.75	2.00	1.95
Foots, bbls NY...........lb.	.06½	.06¾	.06½	.06¾	.08	.06	.11½	.08½
Palm, Kernel, Casks.........lb.	.04½	.05	.04½	.06¼	.08¼	.06	.09	.08
Lagos, 1500 lb casks.......lb.	.05	.06	.05	.06	.07¾	.05¾	.09	.07½
Niger, Casks..............lb.	.03⅞	.04½	.03⅞	.05¼	.07½	.05⅛	.08¾	.07
Peanut, crude, bbls NY......lb.	.....	Nom.	.....	Nom.	Nom.	.....	Nom.	.....
Refined, bbls NY..........lb.	.11	.12½	.11	.14	.15	.12	.15	.14½
Perilla, bbls NY.............lb.	.09	.11	.09	.11	.14½	.10	20	.15
Tanks, Coast...........lb.	.05⅞	.07	.05⅞	.09	.11¼	.08	15⅜	.13
Poppyseed, bbls NY........gal.	1.70	1.75	1.70	1.75	1.75	1.70	1.75	1.70
Rapeseed, blown, bbls NY...gal.	.71	.73	.71	.73	1.00	.74	1.04	1.04
English, drms. NY........gal.	.....	.75	.....	.75	.82	.75	.90	.82
Japanese, drms. NY......gal.	.56	.58	.56	.58	.70	.56	.88	.72
Red, Distilled, bbls..........lb.	.08⅜	.09	.08⅜	.09	.10⅝	.08⅝	.11⅛	.10⅛
Tanks.................lb.	.07½	.08¼	.07½	.08¼	.09¼	.07¾	10¼	.09¾
Salmon, Coast, 8000 gal tks..gal.	.....	.22	.22	.22	.44	.42	.44	.42
Sardine, Pacific Coast tks...gal.	.18	.19	.18	.19	.42	.18	.51	.45
Sesame, edible, yellow, dos...lb.	.09½	.10¾	.09½	.10¾	.12	.09	.12	.11½
White, dos...............lb.	.....	.12	.10	.12	.12½	.10	.12½	.12½
Sod, bbls NY.............gal..	.....	.40	.....	.40	.40	.40	.40	40
Soy Bean, crude...............								
Pacific Coast, tanks.......lb.	.06	.07	.06	.08	.09¼	.07	.10⅞	.09
Domestic tanks, f.o.b. mills, ...lb.	.065	.07	.065	.07	.08⅛	.07	.10½	.08¼
Crude, bbls NY.........lb.	.073	.08	.073	.08	.10¾	.10	.12¾	.11¹
Tanks NY.............lb.	.065	.07	.065	.08	.09¾	.09	.11½	.10¼
Refined, bbls NY..........lb.	.08	.09	.08	.09	.13½	.13	.13½	.13¾
Sperm, 38° CT, bleached, bbls NY..................gal.	.84	.85	.84	.85	.85	.84	.85	.84
45° CT, bleached, bbls NY gal.	.79	.80	.79	.80	.80	.79	.80	.79
Stearic Acid, double pressed dist bags..................lb.	.08½	.09	.08½	.11	.15	.13½	.18½	.15½
Double pressed saponified bags ....lb.	.10½	.12	.10½	.12	.15½	.14½	.19	.15¾
Triple, pressed dist bags..lb	.12	.14	.12	.14	.17	.15½	20½	.17¾
Stearine, Oleo. bbls..........lb.	.09	.08¾	08¼	.08¾	.09½	.08¼	.12	.09¾
Tallow City, extra loose......lb.	.03½	.04	.03½	.04	.07⅝	.04¾	.08⅝	.07
Edible, tierces............lb.	.04	.04½	.04	.06	.09¼	.05½	.10½	.08
Tallow Oil, Bbls, c-1 NY...lb.	.07	.07½	.07	.08¾	.11	.08½	.12	.10⅞
Acidless, tanks NY........lb.	.07⅞	.09	.07⅞	.09	.10	.08¼	.11	.09¾
Vegetable, Coast mats.....lb.	.06	Nom.	.06½	Nom.	Nom.	.06½	Nom.	.08
Turkey Red, single bbls......lb.	.08⅝	.09	.08⅝	.10	.12	.10	.12	.11
Double, bbls..............lb.	.10	.12	.12	.10	.16	.13	.16	.14
Whale, bleached winter, bbls NY....................gal.	.....	.74	.....	.74	.74	.74	.80	.74
Extra, bleached, bbls NY..gal.	.75	.77½	.75	.77½	.76	.76	82	.76
Nat. winter, bbls NY.... gal.	.69	.70	.69	.72	.73	.73	78	.73

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"We"—Editorially Speaking

Dr. Harold W. Elley, who takes us behind the scenes in the du Pont Laboratories to see how this large chemical company trains its chemists, has had a meteoric rise from the ranks. Graduating from Nebraska in 1912, he spent an additional year at the same college in obtaining his master's degree, after which he reversed Horace Greeley's famous advice to young men, and came East. The following three years were spent at Cornell working for his PhD. He then entered the du Pont Company as a research chemist at the Wilmington Laboratories. Within a year he headed the organic division. Two years later he was appointed Assistant Manager of the Chemical Division. Again within two years he was moved forward, this time as head of the Intermediate Division of the Jackson Laboratories. In 1921 Dr. Elley became Associate Director and recently Director of the Chemical Division. Dr. Elley has a delightful home on Saymore Road in Wilmington, where he pursues his hobby, music, and when he can find relaxation away from the multitudinous organic problems of the far-flung du Pont organization.

What with Stalin advocating piece work, differential wages, and a six-day-week and with John Aldridge Chew studying salesmanship at the Harvard School of Business Administration the mid-summer crop of sea serpent stories from the Jersey Coast are forced way off the front pages.

"Pure energy effervescent with ideas"—thus a hard working research assistant describes Dr. William J. Hale. Even one who has never met this dynamic, colorful chemical personality would, after reading his article in this issue, agree with the correctness of this characterization. Dr. Hale does his own thinking. The results are often startling whether it be in some organic synthesis or in a diagnosis of the ills which industry and agriculture are today suffering. Like Jasper Crane's frank statement of the ammonia situation at the same meeting last year, Dr. Hale's paper has provoked widespread discussion, and hundreds of our readers who had not the opportunity of hearing him deliver the address will be glad to have it printed in full.

Dr. Hale's conception of the economic purpose of chemicals and chemical processes in industry, that they shall serve the purpose of lowering industrial costs, and saving industrial time and labor, coincide closely with the ideals of his lamented, chief and father-in-law, Dr. Herbert H. Dow. His insistance upon the business aspects of the farm problem and his sure exposition of its position in the chemical field, has already attracted attention in circles far removed from our own industry.

"Billy Hale", as he is known to his intimates who go hunting and fishing with with him up in northern Michigan, was graduated from Harvard; did post-graduate work in Germany; and began the serious business of life teaching chemistry at the University of Michigan. Since 1919 he has been in charge of the organic research work of the Dow Chemical Company, and from 1925 to 1927 was the Chairman of the Chemical Division of the National Research Council.

Samuel Leverett Lyon who asks the chemical industry an impertinent and important question: "Can Pricing Be Made Scientific?" is one of the country's outstanding economists. He has had a varied career as teacher, lawyer, editor, feature writer, and research director of economics. Mr. Lyon represented this country at the international congress on Commercial Education held in Amsterdam two years ago. He is the author of a great number of books, dealing principally with the various phases of commercial life. Among the best known are, "A Survey of Commercial Education in the United States," "A Functional Approach to Social Economic Data," "Education for Business," "Salesmen in Marketing Strategy," and "Hand-to-Mouth Buying". This last work created a splash of interest and was the occasion of much discussion in the public press. Mr. Lyon makes his home in Washington.

The monthly dinners, given by the Wall Street Economists—a nice little group of serious thinkers—has one very commendable custom. They have but one speaker and he gives his address before the dinner. After coffee has been served, the remainder of the evening is then given over to informal discussion. A full stomach does not tend to help either the speaker nor the listeners to assimilate the fine points of the address. Also this plan permits many to attend the meeting and to hear the guest speaker, yet still to keep evening engagements. For those who have the shank of the evening open the informal open forum around the table is a very pleasant way of spending a couple of hours. Our chemical societies might find the suggestion a welcome one.

Just a year ago we published an article dealing with the growth of the practice of companies making detailed and often elaborate financial reports to stockholders. The latest one released by the I. G., covering the year 1930, need apologize to none insofar as appearance is concerned. The company has as usual gone to the trouble and expense of issuing an English translation. It is almost unbelievable the changes that have been wrought in the past ten years due to the public's participation in the ownership of the large chemical companies of international importance.

In response to a question as to what percentage of plans prepared by equipment companies are misappropriated in some form or another a leading equipment executive recently estimated twenty per cent. This figure seems high. But whether it is ten or twenty per cent is really beside the point. Everyone knows that it is one of the very serious problems that confronts the manufacturer of specialized equipment and one that causes the honest and dishonest purchaser of equipment a monetary loss because the higher overhead of the equipment manufacturer is passed along eventually to the buyers of equipment.

He went on to say that as recently as three weeks ago he had been called on the phone by a competitor who suggested that he get back certain plans that they had been asked to bid on the job and had been given the plans to work up their bid. This is the most effective way of stopping such practices and is not an impossible or utopian idea.

It is not an impossible job to call to the attention of equipment and process machinery manufacturers that if each and everyone would turn down jobs as this particular manufacturer did then the practices that are morally crooked, if not by law illegal, would stop. Some will say that the idea is not workable because some one or two in the group is hungry for business. That may well be true, but nothing is ever accomplished until an attempt has been made. The engineer in this story will be less likely the next time to try to use the brains, money, and time of one company and then use such plans as a basis for bids from that company's competitors.